

# DIPTERA OF AUSTRALIA.

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## PART I.

(Plates II. and III.)

Up to the present time very little has been done towards a knowledge of the Australian Diptera, and this, for more than one reason, is not so remarkable as may at the outset appear. Firstly, to properly work-up any order in the insect fauna of any country, or even any locality, it is absolutely essential that the entomologist should be on the spot, and his observations, to be of value, must necessarily be the result of extended investigations; but not a single species of Diptera of this country has ever been described here. If the entomologist be thousands of miles away he can only deal with shrunk or otherwise altered specimens, besides being quite unable to search out the habitats and study the habits of the species; whereas if these be taken account of the results are eminently more interesting and valuable than the mere descriptions of dried specimens. Secondly, the fragility of some and the smallness of many have not induced *collectors* working amidst a profusion of insects of greater size and more attractive appearance (at the same time readily stored and demanding only a *minimum* of trouble) to concern themselves about Diptera. Thirdly, the few entomologists that there are in this country have found, and still continue to find, so much to do amongst the larger and more easily handled insects which generally excite the first attention. Lastly, the undertaking is one not unaccompanied with great difficulty and liability to blundering; and to successfully commence and prosecute this study, the student must be endowed with considerably more than a mean *quantum* of patience

and perseverance, and, moreover, be prepared to devote particular and exclusive attention to his subject. There are some entomologists, however, who are not disposed to entirely concentrate their attention on a single order, though even a genus alone would possibly entail ample employment for an average lifetime.

In 1864 the total number of known Australian Diptera was estimated by Dr. Schiner at 1056 species, including many collected by Mr. Frauenfeld in the neighbourhood of Sydney during the "Novara" expedition. Since that time very few have been added. A considerable number out of the total have been described by Walker in the British Museum Catalogues, but it is doubtful if many of the descriptions will prove of the slightest value. I believe the same author also in the year 1856 described several in the "Insecta Saundersiana," a work privately printed, now scarce and out of print, and which I have been unable to see. A large number were described by Macquart in his "Diptères Exotiques nouveaux ou peu connus," and its five supplements appearing between 1838 and 1855; but the descriptions are drawn up carelessly, and most of them are little better than those of Walker. There are besides these, other descriptions of detached species by various authors. Our acquaintance then with the Dipterology of this Continent is in a most unsatisfactory condition; the descriptions are scattered and many of them worthless; and, far from advancing science, are calculated to create nothing but disorder.

The present paper is the first contribution towards a work on Australian Diptera, in process of preparation by myself, to appear from time to time in monographs of families. The materials will be derived principally from the rich collection of the Hon. William Macleay, in which I hope the types of all species I shall describe will be found, as it would be of great value for reference, with other advantages, to have all the types contained in one great central collection; but this need not dissuade correspondents from lending me specimens for description. I hope to add largely to the number by my own collecting, particularly among the Cecidomyiidae and other



small kinds. All the Cecidomyidæ described in this paper have been collected by Mr. Masters and myself, chiefly in the environs of Sydney; but we have made numerous excursions to the Blue Mountains, the Hawkesbury district, the Illawarra district and other parts, all, with a single exception, within 40 miles of Sydney. It would have been difficult not to discover new species, for only three had been previously described;\* but I was surprised to find such an abundance of forms, as it has taken only a very short time to bring the total up to 95. This I believe to be only a small fraction of the species of the group occurring in an exceedingly limited area; the number inhabiting New South Wales, not to say the whole of Australia, must be enormous. Other families seem correspondingly to abound in species, and, judging from the comparative abundance of this and other large orders of insects, the Diptera of Australia cannot I think fall short of ten thousand.

I much regret that with my descriptions of the gall-gnats I have been able to add the life-history of but a solitary species, and that only imperfectly. Although I regard the descriptions of little value apart from the observation of the habits of the insect, especially in its larval state, I do not think that should deter me from making this commencement, or from publishing what I have; for I hope that, when once a start has been made, it may induce others, who will now be enabled to form some conception of the amount of work there is to be done, to take an interest in the subject, and to come forward to aid in its elucidation. To determine the life-history of each species of the gall-gnats I now describe, means a considerable amount of careful work, and may take me some time. I should be very glad to receive specimens of Diptera, or portions of malformed plants possibly infested with the larvæ of Cecidomyidæ, from all parts of the country, and hope that members of this and other similar scientific societies will do all in their power for the furtherance of this interesting branch of natural history. The following directions if properly carried out are

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\*In "Reise der Novara" Dipt. by Dr. T. R. Schiner.

sufficient for the collection and preservation of Diptera. The larger species I generally capture with a small bag-net made of very fine silk gauze, and the smaller ones by means of a glass tube charged with chloroform or benzole. The tube is prepared in the following way :—a piece of cotton-wool moistened with one of the above is inserted into the end of the tube, pressed tightly down, and covered by a circular piece of blotting-paper. Of course when not in use the tube is kept corked. When a large insect has been captured in the net, take one of the chloroform tubes and secure the insect in it against the side of the net; then, with a little manipulation it is easy to put in the cork, and the insect dies almost instantly. Having left it there for a short time it is taken out and pinned in a cork-bottom collecting box, and there is no further trouble with it; but unless specimens are afterwards carefully kept in a tight box provided with a lump of camphor they will speedily be destroyed by mites or some of the small beetles prejudicial to natural history collections. In using the glass-tube for capturing, the insects must always be at rest, and as they may be commonly thus found under the ledges of overhanging rocks, on logs, and in similar situations, it is generally an easy matter to place the mouth of the tube gently over them; they will immediately fly up the tube which must then be quickly corked. When resting on a flower or a leaf the palm of the hand may be employed to inclose the insect within the tube. Should the inside surface of the tube be at all damp it is necessary to uncork and expose it for a few seconds to the drying influence of the atmosphere, otherwise, enclosed insects, especially if they be very minute, are liable to adhere to the glass, and their wings and antennæ to be spoiled. As soon as the insects are dead they must be transferred to a pill-box, and carefully placed between layers of soft fresh leaves or petals of flowers, so as to prevent shaking, while the moisture from the leaves will prevent them from becoming brittle, and thus liable to get broken. On reaching home they should be at once unpacked and neatly gummed on small pieces of card, and pinned through the latter. A slight dot of gum will suffice. The insects should

be lifted on to the gummed card with a needle, great care being taken not to touch the wings with the gum. When insects are sent through the post they must on no account be placed in fragile boxes, and must always be firmly pinned, otherwise they may be destroyed before reaching their destination. The box should be light and at the same time as strong as possible, lined with cork at the top and bottom. Having securely pinned the specimens the box should first be tightly tied, and then well wrapped in cotton wool or some similarly soft material before being eventually carefully enveloped and tied up in thick paper. The address and postage stamps should be placed on a label attached by string to the package, but on no account must they be put on the wrapper of the box, as the process of obliteration pursued by the postal authorities is likely to be attended with a disastrous result as far as the contained specimens are concerned.

I wish here to cordially thank the Hon. William Macleay, who has done all in his power to facilitate my work, and also Mr. Masters, whose aid in the collection of specimens has been very considerable.

The writings of Baron R. Osten-Sacken, Prof. Loew, and Mr. Winnertz have given much information as to the classification and life-history of the Cecidomyidæ, and I desire to freely acknowledge the great help I have obtained from these and many other older authorities. Unfortunately my resources have not included Dr. Schiner's *Fauna Austriaca, Diptera*, therefore I have been unable to avail myself of the mass of valuable information therein contained.

At the head of the descriptions of Cecidomyidæ described for the first time in this paper, I have given micrometrical measurements of the antennæ, wings, and bodies of what I consider average-sized specimens, in thousandths of an inch, and corresponding fractions of a millimètre.

The following table will show approximately the system of classification of the families I propose to adopt, founded more or less on that of Brauer and Schiner:—

## Section I. DIPTERA ORTHORHAPHA.

## Division I. NEMATOCERA.

Sub-division 1. *Oligoneura*.

Fam.—Cecidomyiidae, Sciaridae, Mycetophilidae, Simuliidae, Bibionidae.

Sub-division 2. *Polynœura*.

Fam.—Blepharoceridae, Culicidae, Chironomidae, Orphnephilidae, Psychodidae, Tipulidae, Dixidae, Rhyphidae.

## Division II. BRACHYCERA.

Sub-division 1. *Cyclocera*.

Fam.—Xylophagidae, Cœnomyiidae, Stratiomyidae, Acanthomeridae, Tabanidae.

Sub-division 2. *Orthocera*.

Fam.—Leptidae, Asilidae, Midasidae, Nemestrinidae, Bombyliidae, Therevidae, Scenopinidae, Cyrtidae, Empidae, Dolichopodidae, Lonchopteridae.

## Section II. DIPTERA CYCLORHAPHA.

## Division I. PROBOSCIDEA.

Fam.—Syrphidae, Myopidae, Conopidae, Pipunculidae, Platypezidae, Oestridae, Tatchinidae, Dexidae, Sarcophagidae, Muscidae, Anthomyiidae, Cordyluridae, Helomyzidae, Sciomyzidae, Psilidae, Micropezidae, Ortalidae, Trypetidae, Lonchæidae, Sapromyzidae, Phycodromidae, Heteroneuridae, Opomyzidae, Sepsidae, Diopsidae, Piophilidae, Ephydriidae, Geomyzidae, Drosophilidae, Oscinidae, Agromyzidae, Phytomyzidae, Asteidae, Borboridae, Phoridae.

## Division II. EPROBOSCIDEA.

Fam.—Hippoboscidae, Nycteribidae.

## Order DIPTERA.

Wings two ; mesothoracic, membranous, with radiate veins ; posterior wings wanting, represented by a pair of small clavate filaments called halteres ; mouth suctorial ; metamorphosis perfect ; larva apodal ; pupa inactive.

## Section I. ORTHORHAPHA.

The pupa case opening longitudinally.

## Division I. NEMATOCERA.

The flies belonging to this division are characterised by the possession of long thread-like antennæ consisting of several joints, in many instances beautifully ornamented with whorls of long delicate hairs, especially in the males ; nearly all are to be recognised without much difficulty by their long slender body and limbs, small rounded head, and elevated thorax ; and as typical examples might be mentioned the familiar Mosquitoes (Culicidæ) whose blood-sucking propensities are only too well-known, the Daddy-longlegs (Tipulidæ), and the swarms of Midges (Chironomidæ, Cecidomyidæ, &c.). They are to be found especially in damp and shady situations, and are to be met with abundantly in all regions presenting these essential conditions of their existence ; but there is, nevertheless, in these insects, a considerable variety both of character and habits ; these latter will be fully considered as we come to deal with each family separately in future papers, though it will be well to here give a preliminary sketch of them.

The NEMATOCERA, formerly regarded as divisible into only two families, is now split up into thirteen.

Fam. I.—CECIDOMYIDÆ (Gall Midges). *Characters:* Small delicate species ; antennæ long, necklace-like ; often no ocelli ; legs very long, slender ; coxæ short ; tibiæ slender, without spurs ; wings well haired, with very few veins.

*Hab.*—In their preparatory states generally inhabiting gall-like excrescences formed by them on certain parts of living plants, but also found in rolled leaves, in decaying wood, under bark, etc. ; perfect insect frequently common in caves and shady places.

Fam. 2.—SCIARIDÆ (Shade Midges). *Chars.* Generally small ; antennæ moderately long, curved, with cylindrical bead-like joints ; ocelli three ; legs long, slender ; the tibiæ with or without spurs ; wings often dark, their venation approaching that of the last family.

*Hab.*—The larvæ and pupæ found under the bark of logs or felled trees, or at the roots of decaying plants ; the former of one species have received the name of Army-worm (Heerwurm), from the habit of congregating in large numbers and travelling together in a body ; perfect insect generally abundant in forests or well-wooded districts.

Fam. 3.—MYCETOPHILIDÆ (Fungus Midges). *Chars.* Some small, others of very moderate size, and sometimes with beautifully marked wings ; ocelli three or two ; antennæ short ; proboscis short ; legs long ; coxæ elongated ; tibiæ spurred ; wings without discoidal cell ; venation more elaborate than in the two preceding.

*Hab.*—The larvæ living chiefly upon fungi, wood detritus, or decaying vegetable matter ; some spin a silken web within which they live ; perfect insect very active, capable of leaping ; found in damp situations.

Fam. 4.—SIMULIDÆ (Sand-flies). Containing only one genus. *Chars.* Individuals of small size ; antennæ cylindrical ; ocelli none ; all parts of the mouth fully developed ; legs short ; hind tibiæ and first joint of the tarsi broad ; tibiæ without spurs ; wings broad, rather indistinctly veined.

*Hab.* Larvæ living in the stems of aquatic plants, to which they finally attach cocoons ; perfect insect capable of inflicting painful wounds ; swarming generally in the vicinity of marshy places.

Fam. 5.—BIBIONIDÆ. *Chars.* Moderately sized ; body and legs shorter and more robust than in the species of the other families ; antennæ short ; ocelli three ; prothorax large ; wings large.



*Hab.*—Found, in their preparatory states, in the ground, or in dung ; perfect insects often with a sluggish flight ; common on flowers.

Fam. 6.—BLEPHAROCERIDÆ. *Chars.* Small ; antennæ long and slender ; eyes contiguous or non-contiguous, alike in both sexes ; ocelli three ; legs long ; coxæ short ; posterior tibiæ generally with strong spurs ; wings broad and long, in venation approaching the Mycetophilidæ.

*Hab.*—Very little is known about the habits of these species ; a Brazilian example, according to Dr. Müller, exhibits a strange form of female dimorphism. The male lives on flowers, so also does one of the females ; but the other, like the female mosquito, is provided with a long proboscis, and sucks the blood of animals.

Fam. 7.—CULICIDÆ (Mosquitoes). *Chars.* Very slender, moderately sized ; antennæ long and slender ; proboscis in the female containing all the parts found in any Dipterous insect ; ocelli none ; thorax stout ; legs long and slender ; wings slender ; veins more than six in number in some.

*Hab.*—Eggs deposited in water ; larvæ found abundantly, swimming with a peculiar jerking motion in ponds and ditches ; perfect insect abundant in the neighbourhood of water. It is only the females that feast upon the blood of animals ; the males feed only on vegetables ; they are very fond of the honey of flowers, to which also the females are attracted.

Fam. 8.—CHIRONOMIDÆ (Midges). *Chars.* Small ; antennæ slender, beautifully adorned with hairs ; proboscis fleshy ; ocelli obsolete ; abdomen and legs long and slender ; wings slender, the veins very similar to those of the gnats.

*Hab.*—The larvæ and pupæ of some are aquatic ; some others live in dung or under bark ; perfect insect common in the neighbourhood of water ; some, like the Culicidæ, have the power of inflicting wounds in animals.

Fam. 9.—ORPINEPHILIDÆ. Only a single genus. *Chars.* Small insects ; antennæ short ; ocelli absent ; proboscis little projecting ;

thorax elevated ; legs rather short ; wings long and narrow ; veins uniformly distinct.

*Hab.*—Very little is known. *Orphnephila testacea*, the type of the family, is said to be found in bakehouses.

Fam. 10.—PSYCHODIDÆ (Moth Midges). *Chars.* Very small flies ; antennæ rather long, whorled with hairs ; ocelli none ; body clothed with long coarse hair ; legs rather long ; tibiæ without spurs ; wings broad and hairy, with many longitudinal veins.

*Hab.*—Larvæ living in fungi and rotten vegetable matter ; perfect insect frequently occurring on walls and windows ; some at least are capable of jumping.

Fam. 11.—TIPULIDÆ (Daddy-longlegs). *Chars.* The largest flies of the division, if not of the order ; antennæ long and thread-like, furnished with long hairs, or pectinated ; almost all without ocelli ; proboscis fleshy, rather prominent ; thorax with a V-shaped transverse suture ; legs extremely long and fragile ; tibiæ often spurred at the tip ; wings long, with a very complete venation ; discoidal cell present in most cases ; basal cells very long.

*Hab.*—The larvæ live in the ground, in rotten wood, in fungi, on the leaves of plants, or in water, etc. ; pupæ found in the same situations ; imagines frequenting water, damp situations, flowers, etc., and often to be found in caves or under overhanging rocks.

Fam. 12.—DIXIDÆ. *Chars.* Small gnats ; antennæ long ; ocelli wanting ; proboscis rather prominent ; body slender ; legs long and slender ; wings somewhat large, occasionally spotted ; six longitudinal veins ; discoidal cell wanting.

*Hab.*—Larvæ aquatic ; perfect insects congregating in swarms in damp wooded localities.

Fam. 13.—RHYPHIDÆ. Only a single genus. *Chars.* Moderate-sized flies ; antennæ moderately long ; ocelli three ; legs rather long and slender ; wings large and broad, with a discoidal cell.

*Hab.*—Larvæ feeding on rotten vegetable matter, cow-dung, etc. ; perfect insects often seen on the walls of outdoor closets and sheds, or in caves, and other damp places.

KEY TO THE FAMILIES OF NEMATOCERA.

A. Thorax without any transverse suture.

a. Tibiæ not spurred.

\* Wings haired.

Longitudinal veins few.....*Cecidomyidæ*. 1.

Longitudinal veins numerous.....*Psychodidæ*. 10.

\*\* Wings naked.

§ No ocelli.

1. Legs long ; antennæ with more than 12 joints.

Costal vein continued round the  
margin of the wing.....*Culicidæ*. 7.

Costal vein terminating near the  
tip of the wing.....*Chironomidæ*. 8.

2. Legs rather short ; antennæ short.

Costal vein continued round the  
posterior border.....*Orphnephilidæ*. 9.

3. Legs short ; antennæ with less than

12 joints.....*Simulidæ*. 4.

§§ Ocelli.

No discoidal cell.....*Bibionidæ*. 5.

A discoidal cell.....*Rhyphidæ*. 13.

b. Tibiæ spurred.

† Ocelli.

Anterior tibiæ spurred.....*Blepharoceridæ*. 6

All tibiæ spurred.....*Mycetophilidæ*. 3.

With or without spurs .....*Sciaridæ*. 2.

†† No ocelli.

All tibiæ spurred.....*Dixidæ*. 12.

B. Thorax with a V-shaped suture.....*Tipulidæ*. 11.

TERMINOLOGY.

Under this heading I shall include those technicalities employed in the descriptions of Diptera, both exclusively or in a more or less modified sense ; it is very necessary that I should state

them, more particularly as the terminologies of any two authors are unfortunately only rarely alike. Throughout the following work I shall adhere to the terms adopted by Baron Osten-Sacken and Prof. H. Loew in their masterly monographs of the Diptera of North America, regarding it, in the words of the latter, as the "duty of a later author to accommodate himself to the usages of his predecessors, especially those who have written standard works," that is, as far as it lies in his power. The following, then, is for the most part taken from the first volume of those monographs, by Prof. Loew.

### 1. *The Head.*

The back of the head opposite to the thorax is the *occiput*, and is prominently perceptible in both Diptera and Hymenoptera carrying their heads free; that portion of it lying over the attachment of the head is the nape (*cervix*). The front, forehead, or brow (*frons*) is that part of the head stretching from the antennæ as far as the occiput, and is limited laterally by the compound eyes. The crown (*vertex*) is the upper part of the head, upon which frequently are the simple eyes (*ocelli*), generally three in number. The limit between the occiput and the front is styled the vertical margin (*margo verticalis*). Most of those Diptera undergoing their metamorphoses within the larva-skin possess, immediately above the antennæ, an arcuated impressed line, which seems to separate from the front a small, usually crescent-shaped, piece, termed the frontal crescent (*lunula frontalis*); the impressed line, which continues over the face nearly as far as the border of the mouth, is called the frontal fissure (*fissura frontalis*). When the eyes meet on the front so as to divide it into two triangles, the superior one is called the vertical triangle (*triangulum verticale*), the inferior the frontal triangle (*triangulum frontale*). The anterior portion of the head reaching from the antennæ to the border of the mouth or oral margin (*peristomium*) is the face (*facies*). The antennæ are separated into two series of joints; the first, consisting of the two basal joints, called the joints of the *scapus*, and the following

those of the *flagellum*. Beneath the antennæ there are sometimes found longitudinal furrows (*foveæ antennales*) for their reception. The sides of the head, from the eyes downward, are called cheeks (*genæ*). A somewhat swollen ring sometimes surrounds or partly encompasses the compound eyes, and is termed the orbit (*orbita*), the successive parts of which are called the anterior (*orbita anterior sive facialis*), inferior (*inferior s. genalis*), posterior (*posterior s. occipitalis*), superior (*superior s. verticalis*), and frontal (*frontalis*) orbits. Where no such ring is visible, a distinct colour or some peculiar structure marking the nearest surroundings of the eyes is described as an orbit. We will now pass on to the mouth (*os*). The oral parts employed for sucking are called the sucker or proboscis (*proboscis*); when attached to a long and generally cylindrical prolongation of the head, this part is called the snout or rostrum (*rostrum*), and must be distinguished from the latter organ. They may project from a wide aperture often occupying a great part of the under surface of the head, called the mouth-hole (*cavitas oris*). The common fleshy root of the oral parts is connected by a membrane with the border of the mouth. This membrane often has a fold, sometimes almost corneous, and is then called the clypeus or shield (*clypeus s. prelabrum*); it is either entirely concealed by the anterior border of the mouth and is then usually movable, or it projects over it as a ridge and is then usually immovable. Generally the largest of the mouth-parts is the fleshy under lip (*labium* or *hypostoma*), made up of the stem (*stipes*) and the knob (*capitulum labii*) formed by the two suctorial flaps (*labella*). Close by are to be seen the palpi (*palpi*), which are important to notice, being frequently very characteristic. The tongue (*lingua*), under jaws (*maxillæ*), upper jaws (*mandibulæ*), and upper lip (*labrum*), are not only inconspicuous, but generally difficult to determine, and rarely of value in distinguishing species.

According to Meinert (Ent. Tidskr. i. pp. 150-153) the mouth consists of the *pharynx*, which is divided into two portions, the *epipharynx* and the *hypopharynx*. This is followed by the first

*metamera*, the upper portion of which, combined with the *epipharynx*, forms the *labrum*; its lower part is generally separated from the *hypopharynx*, and forms the *labium*. Behind this is the second *metamera*, that of the *maxillæ*, and the *maxillary lobes* are simply processes of it, and not jointed organs; the *maxillary palpi* are generally similar, only being jointed to the *metamera*, and themselves articulated in *Culex* and *Tipula*. The third and last *metamera*, that of the mandibles, is generally separated from the preceding, though its hinder part is strongly soldered to the cephalic plate: it is, however, never exposed.

## II. *The thorax.*

The *mesothorax* is very largely developed in this order, being so much larger than the *prothorax* and *metathorax* that it forms the greatest part of this division of the insect's body; on account of this it is designated the thorax, while different names are bestowed upon characteristic parts of the *prothorax* and *metathorax*. The former frequently forms a neck-like prolongation which bears the head, and is then called the neck (*collum*). In some cases the fore corners of the mesothorax or the shoulders (*humeri*) are covered by a lobe of the prothorax (*lobus prothoracis humeralis*), distinctly separated from the mesothorax; if this lobe be so soldered to the mesothorax that it is impossible to detect a distinct limit between them, except in general by their colour or hair, it is styled the shoulder callosity (*callus humeralis*). When the prothorax applies closely to the anterior border of the mesothorax, it has then the name of collar (*collare*). An important character, in its presence or absence, is a transverse furrow (*sutura transversalis*) frequently found crossing the middle of the upper side of the mesothorax, and terminating on each side just before the base of the wing. On each side of the breast—the breast side (*pleura*)—there is beneath the shoulder a spiracle (*stigma prothoracis*).

The scutcheon (*scutellum*) is separated from the back of the mesothorax by a furrow, and is situated between the wings. A part of the metathorax is to be seen beneath the scutellum, called the *metanotum*; this is generally found descending obliquely, often very convex, and on each side with a more or less inflated



space, called the lateral callosity of the metanotum (*callus metanoti lateralis*). The poisers or balancers (*halteres*) have their origin beneath this callosity, and in front of each of them we see the spiracle of the metathorax (*stigma metathoracis*). The membranous covers sometimes found above this spiracle have the name of covering scales (*tegulæ* or *squamæ*).

### III. *The abdomen.*

The upper side is generally so called, the name of belly (*venter*) being applied to the under side. The terminal joint is furnished in the male with appendages destined to take hold of the female in copulâ, and if they partake of the form of pincers and are not bent under the body these are called *forceps*; in the female with the organ for laying eggs (*ovipositor*), which may either be called the borer (*terebra*) or the style (*stylus*), depending on its shape.

### IV. *The wings.*

A precise nomenclature of the veins and cells of the wings is of the utmost importance; their existence and mutual arrangement afford the most valuable criteria in the systematic distribution of the order, and in the definition of the species. Dr. Schiner (Verh. z-b. Gesellsch. in Wien, Band XIV.) has proposed a new, and, in many respects, excellent nomenclature for the veins and cells of the wings in the Diptera; but I prefer to fall back upon that of Prof. Loew, which preceded the other by two years, and at the same time adequately fulfils its purpose.

As pointed out by Prof. Loew, the venation of the wings throughout all the Diptera occurs merely as modifications of a common type, and that type is to be found amongst the Muscidæ. For illustration, however, he selects three wings, one from the Ortalidæ (*Ortalis*), the second from the Empidæ (*Empis*), and the last from the Asilidæ (*Dasygogon*), from which three he can deduce the whole plan of venation, and consequently the cellular system. As an endeavour to simplify matters I will combine in a single diagram the wings referred to, and form an ideal typical wing, thus enabling me to tabulate six or seven pages of Prof. Loew's

letterpress. From this we shall be able afterwards without much difficulty, to interpret correctly any incomplete venation, which, as he intimates, is often by far more difficult of correct understanding than a very intricate example.

### VEINS.\*

Primarily we have six longitudinal veins issuing from the two main trunks, three from the first and three from the second; all the remaining venation springs from them.

- a. Transverse shoulder-vein (*vena transversa humeralis*).
- b. Auxiliary vein (*vena auxiliaris*).
- c. First longitudinal vein (*vena longitudinalis prima*).
- d. Second longitudinal vein (*vena longitudinalis secunda*).
- e. Third longitudinal vein (*vena longitudinalis tertia*).
- f. Fourth longitudinal vein (*vena longitudinalis quarta*).
- g. Fifth longitudinal vein (*vena longitudinalis quinta*).
- h. Sixth longitudinal vein (*vena longitudinalis sexta*).
- i. Small or middle transverse vein (*vena transversa minor s. media*).
- k. Hinder transverse vein (*vena transversa posterior*).
- l. }  
m. }  
n. } Costal vein (*vena costalis*).
- o. }
- p. Anterior basal transverse vein (*vena transversa basalis anterior*).
- q. Posterior basal transverse vein (*vena transversa basalis posterior*).
- r. Rudiment of a fourth trunk.
- s. Axillary incision (*incisura axillaris*).
- t. Anterior branch of the third longitudinal vein (*venae longitudinalis tertiae ramus anterior*).
- u. Anterior intercalary vein (*vena intercalaris anterior*).
- v. Posterior intercalary vein (*vena intercalaris posterior*).

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\* Letters under this and the next head refer to diagram on Plate III., fig. 25.

*Observations.*

*k.* Generally the longest transverse vein of the wing, and of the highest systematic importance.

*p.* and *q.* Usually present.

*p.* The absence of this vein is characteristic for some families.

*q.* Sometimes meeting *h* at a very acute angle or running into the border without having met that vein; in all cases dividing the space between *g* and *h* into two parts.

*r.* Occasionally giving rise to rudimentary branches or axillary veins (*venæ axillares*), or less frequently to complete longitudinal veins (in the case of such a development, the foremost of the veins is generally connected near its base with *h*, by a transverse vein), still regarded as axillary, but may be numbered as the seventh and (if another) the eighth longitudinal veins.

*v.* In some cases meets *g* before reaching the margin.

## CELLS.

A middle space or band extending from the base of the wing to the tip, separates the three anterior sections divided by the three longitudinal veins belonging to the anterior main trunk, and the three posterior sections resulting from the longitudinal veins of the posterior main trunk; these three sections in each case are styled exterior, middle, and anterior, and may be again divided into smaller cells.

A. First costal cell (*cellula costalis prima*).

B. Second costal cell (*cellula costalis secunda*).

C. Third costal cell (*cellula costalis tertia*).

D. Marginal cell (*cellula marginalis*).

E. Submarginal cell (*cellula submarginalis*).

F. First posterior cell (*cellula posterior prima*).

G. Second posterior cell (*cellula posterior secunda*).

H. Third posterior cell (*cellula posterior tertia*).

I. Discal cell (*cellula discoidalis*).

- K. First or large basal cell (*cellula basalis prima s. major*).
- L. Second basal cell, or anterior of the small basal cells.
- M. Third basal cell, or posterior of the small basal cells.
- N. Anal or axillary corner of the wing (*angulus analis s. axillaris*).
- O. Alar appendage (*alula*).

*Observations.*

E. Cells here of the utmost importance. When *d* and *e* are simple, there is therefore only one sub-marginal cell; but when *e* has *t*, we count two cells, an anterior and a posterior one; when *t* of *e* is also connected with *d* by a transverse vein, the number of submarginal cells amounts to three; that one formed by the inner part of the anterior submarginal cell is called the anterior sub-marginal cell; when *t* of *e* takes the form of a transverse vein to *d*, only an anterior and an exterior submarginal cell are distinguished.

F. Usually subject to no partition, but sometimes closed before reaching the margin.

G. Frequently divided by the presence of *u*, and this occurs whenever *f* emits a hind branch before its end. When G and I are united in consequence of the absence of *k* the cell thus formed retains the name of G.

I. This is one of the most important cells belonging to the first section of the posterior part of the wing. When *p* is wanting, L is considered part of I. When *u* is present, sometimes the part of *k* before or behind it is wanting, then I is regarded as anteriorly or posteriorly opened, as the case may be.

K, L, and M. The first is generally the longest, and the three are usually spoken of as "one large and two small basal cells," but when *g* is stretched longitudinally so that M joins the border, or it is distinguished from L by a much greater length, though closed, M is termed the anal cell (*cellula analis*).

## CLASSIFICATION OF THE CECIDOMYIDÆ.

The term *Cecidomyia* was first applied by Meigen in 1803 to a genus established by him to contain those flies (with the exception of *Lasioptera* and *Clinorhyncha*) now divided into several sub-genera, and placed by Prof. Loew in the section CECIDOMYINA of the family Cecidomyidæ. In 1818 Meigen (Syst. Besch. I.) also instituted the genera *Lasioptera* and *Campylomyza*, placing the three in a tribe denominated *Tipulariæ gallicolæ*; and at this period, those families at present constituting the great division Nematocera, were simply regarded as genera belonging to a single family Tipulariæ. The family name Tipulariæ and the generic *Tipula* were first employed by Linnaeus (Syst. Nat.) in 1735, but the study of the gall midges really only dates from about the beginning of the nineteenth century, though Linnaeus described four or five as early as 1761; also Fabricius and Shrank described a small number in 1781, all under the name of *Tipula*. Kirby (Trans. Linn. Soc. Lond. 1798) has published a long account of the habits and the metamorphoses of *Tipula tritici*, a renowned enemy of wheat crops, at the present day classified as *Cecidomyia (Diplosis) tritici*.

In 1825 Latreille substituted Nemocera for the old family name Tipulariæ, and he divided the group into two tribes (1) *Culicides* and (2) *Tipulariæ*, the genera *Cecidomyia* and *Lasioptera* being placed in a kind of sub-division, Gallicolæ, together with *Psychoda*, &c.; but *Campylomyza* was separated from them and located with flies which now contribute to the family Mycetophilidæ, then called Fungivoræ.

In the year 1828 Wiedemann (Auss. Europ. Zwfl.) adopted the classification of Meigen, but added a species of *Lasioptera*, two of *Cecidomyia*, and a *Campylomyza*, all described by Say from North America a short time previously, including *Cecidomyia destructor* in 1817.

Macquart in 1834 (Hist. Nat. des Insects, Dipt.) converted the tribes *Culicides* and *Tipulariæ* into families, and the latter

was split up into tribes, adopting exactly the same terms employed by Latreille to designate his subdivisions, viz. :—T. Culiciformes, Terricoles, Fongicoles, Gallicoles, and Florales; the fourth of these at the same time stood as follows :—

A. Wings lying horizontally, with a small number of veins.

B. Four posterior cellules; second petiolate.

C. Second posterior cellule narrow at the base.

1st Genus *Lestremia*.

CC. Second posterior cellule very wide at the base.

2nd Genus *Zygoneura*.

BB. Three or four veins only.

D. Three longitudinal veins.

3rd Genus *Cecidomyia*.

DD. Two longitudinal veins.

4th Genus *Lasioptera*.

AA. Wings bending in the form of a roof, with numerous veins.

5th Genus *Psychoda*.

This author remarks that the genera *Lestremia* and *Zygoneura*, by the neuration of the wings, approached the Fongicoles (now the family Mycetophilidæ), amongst which he placed *Campylomyza*; and also that *Psychoda* was related to the Florales (now Rhyphidæ and Bibionidæ) by the shortened form of the body and the feet.

Rondani in 1840 made the first attempt at a division of *Cecidomyia* into sub-genera, and he also divided the whole family into two great sections, CECIDOMYINÆ and LESTREMINÆ, the latter to admit the genera *Campylomyza*, *Catocha*, *Lestremia*, and his own new genus *Micromyia*; but he founded his scheme on such uncertain criteria that subsequent authors have regarded it as entirely worthless, though it can scarcely be estimated of no value, for his project at least formed the basis of a more perfect classification. Since then Rondani has established a number of genera in this family, afterwards discovered to be synonymous with genera already accepted.



In 1850 Prof. (then Dr.) Loew wrote a valuable monograph of the European Cecidomyiide, and, rejecting the attempt of Rondani, put another system in its place. He formed a number of sub-genera well adapted to satisfy that want to make these divisions into sub-genera, and not only that, but supplied further definitions to each of them, by means of which the contained species might again be divided and characterised, a necessary step to take on account of the great difficulty naturalists otherwise would have experienced in dealing with such a numerous family of small insects.

His main arrangement of the first section is as follows:—

Genus I. CECIDOMYIA, Meigen.

A. With three longitudinal veins. 1.

- |   |   |                                                                                 |                      |
|---|---|---------------------------------------------------------------------------------|----------------------|
| 1 | { | Collare more or less overhanging or hood-shaped. Wings without iridescence...   | Sub-genus.           |
|   |   | Collare very slightly developed.....                                            | <i>Hormomyia</i> .   |
| 2 | { | Transverse vein wanting or moderately oblique.....                              | 3.                   |
|   |   | Transverse vein so oblique that the second longitudinal vein appears two-rooted | 5.                   |
| 3 | { | Male with twice as many flagellar joints as the female.....                     | <i>Diplosis</i> .    |
|   |   | Both sexes with an equal number of antennal joints .....                        | 4.                   |
| 4 | { | Antennæ hair-whorled.....                                                       | <i>Cecidomyia</i> .  |
|   |   | Antennæ with a short pubescence.....                                            | <i>Asphondylia</i> . |
|   |   | Flagellar joints sessile or almost sessile in both sexes.....                   | <i>Dirhiza</i> .     |
|   |   | Flagellar joints pedicelled in both sexes...                                    | <i>Epidosis</i> .    |

B. With four longitudinal veins..... *Asynapta*.

Genus II. LASIOPTERA, Meigen.

- |                                       |                     |
|---------------------------------------|---------------------|
| Mouth prolonged in a rostrum .....    | <i>Clinorhyncha</i> |
| Mouth not prolonged in a rostrum..... | <i>Lasioptera</i> . |

Winnertz in 1853 contributed another admirable monograph towards a knowledge of European gall-midges (Linnaea Entom. Vol. viii.), when he described a large number of fresh species, and added another genus *Spaniocera*, and a sub-genus of *Cecidomyia* which he designated *Colpodia*. After a lengthy and careful study of the material at his disposal, he expressed his conviction that all the sub-genera of Loew were founded on good characters, but that some of them required a more exact diagnosis, and that a still further division of them would greatly promote the determination of the species; and in order to fulfil this requirement he distributed the species of the first sub-family as below:—

## I. CECIDOMYIA, Meigen.

### I. WINGS WITH THREE LONGITUDINAL VEINS.

A. Transverse vein placed between the root and the tip of the first longitudinal vein.

*Cecidomyia*.—The second longitudinal vein ascending from the base in a flattened arcuation, and reaching the margin of the wing a little before its apex.

The number of the antennal joints usually equal in both sexes, the joints either pedicelled or sessile.

1. Antennal joints in the ♂ pedicelled, in the ♀ sessile.
2. In the ♂ and ♀ pedicelled (or the ♀ partly so).
3. In the ♂ and ♀ sessile.

*Diplosis*.—The second longitudinal vein ascending from the base in a flattened arcuation, and reaching the margin of the wing at or beyond its apex.

Antennæ in the ♂ 2-+24-jointed, sometimes with one rudimentary joint more, the pedicelled joints alternately single and double, very seldom all the joints simple, in several species the joints decorated with long hairs in the upper side.

Antennæ of the ♀ 2-+12-jointed, sometimes with one rudimentary joint more, the joints pedicelled, cylindrical.

(a) The second longitudinal vein reaching the margin of the wing at its apex.

1. Flagellar joints of the antennæ of the ♂ alternately single or double.

\* Wings unspotted.

\*\* Wings variegated.

2. Flagellar joints of the antennæ in the ♂ quite simple, with only one hair-whorl.

(b) The second longitudinal vein reaching the margin of the wing beyond its apex.

1. Hair-whorls of the antennæ of the ♂ equally long on the upper and under sides.

\* Wings unspotted.

\*\* Wings variegated.

2. Antennæ of the ♂ decorated with long hairs on the upper side.

*Asphondylia*.—The second longitudinal vein ascending from the base in a flattened arcuation, and reaching the margin of the wing beyond its apex.

Antennæ in both sexes with cylindrical joints, the joints without hair-whorls.

*Hormomyia*.—The second longitudinal vein ascending from the base in a flattened arcuation, reaching the wing-margin either at or beyond the apex.

Thorax more or less gibbose, frequently extending over the head in the form of a hood. Flagellar joints of the antennæ in the ♂ pedicelled, those of the ♀ either pedicelled or sessile.

(a). Thorax extending over the head in the form of a hood.

(b). Thorax gibbose.

*Colpodia*.—The second longitudinal vein ascending from the base with a double curvature, reaching the wing-margin beyond the apex. Transverse vein long.

B. Transverse vein very oblique, originating at the root of the first longitudinal vein.

*Dirhiza*.—The second longitudinal vein not undulating at the base, but ascending in a flattened arcuation, and the flagellar joints of the antennæ sessile or almost sessile in the ♀.

*Epidosis*.—The second longitudinal vein ascending from the base with a double curvature, reaching the wing-margin beyond the apex.

The number of the antennal joints unknown; the joints pedicelled in both sexes.

## II. WINGS WITH FOUR LONGITUDINAL VEINS.

*Asynapta*.—(a). The transverse vein and the root of the second longitudinal vein as in *Epidosis*.

(b). The transverse vein and the second longitudinal vein as in *Diplosis*.

## II. SPANIOCERA, Winnertz,

## III. LASIOPTERA, Meigen.

(a). Wing with a white spot in the middle of the costal vein.

(b). Wing without spot,

*Clinorhyncha*.—Mouth parts prolonged in a rostrum.

With regard to the second section of the family, Winnertz prefers to look upon its species as representing a distinct family having its proper position between the Cecidomyidæ and the Mycetophilidæ. He afterwards (in 1869) wrote a paper solely on this section, which we will consider in its turn.

Baron R. Osten-Sacken, in 1862, wrote a preliminary or introductory paper on the North American Cecidomyidæ which appeared in the first monograph on Diptera issued by the Smithsonian Institution, and mainly prepared by Prof. Loew. In the first part

of the volume Dr. Loew, in giving a general sketch of the systematic distribution of Diptera, remarks, with regard to the family Cecidomyiæ, that it is one rather difficult to define, and consequently also difficult to exactly characterize. He considers that the limits between the families Cecidomyiæ and Mycetophilidæ are not easily fixed, since *Zygoneura* shows a combination of the characters of both, the coxæ being far less elongated and the spurs of the tibiæ far shorter than in any other genus of Mycetophilidæ; moreover, the antennæ are moniliform with verticillate hairs, as is frequently the case in the Cecidomyiæ and never so among Mycetophilidæ. But, he goes on, the total *habitus* of the *Zygoneuræ* being more like that of the former than of the latter, and the tibial spurs being so very short that in some species they can only be discovered by the closest scrutiny, he thinks himself justified if he adds them to the Cecidomyiæ, though in many respects they agree with the genus *Sciara*, which in his opinion has its natural place amongst the Mycetophilidæ. The family is divided by Prof. Loew into two sections; the first section he styles CECIDOMYINA, and the second ANARETINA, which he thus characterizes. The CECIDOMYINA have on their wings four longitudinal veins, the last two of which often coalesce in the beginning of their course, or are more or less incomplete; they have no ocelli, and the first joint of their tarsi is much shortened; the genera belonging here are *Cecidomyia*, Meigen; *Diplosis*, Loew; *Asphondylia*, Loew; *Hormomyia*, Loew; *Colpodia*, Winn.; *Dirhiza*, Loew; *Epidosis*, Loew; *Asynapta*, Loew; *Lasioptera*, Meigen; and *Clinorhyncha*, Loew. In the genera of the second section, the ANARETINA, between the second and third of those veins of the wings which the first section possesses, another longitudinal vein is inserted, being simple only in *Campylomyza*, while it is furcate in all the other genera; the first tarsal joint is not shortened, and in all genera, with the single exception of *Cecidogona*, there are distinct ocelli; to this section belong *Campylomyza*, Meigen; *Cecidogona*, Loew; *Anarete*, Hal.; *Catocha*, Hal. (= *Macrostyla*, Winn.); *Lestremia*, Macq. (= *Diamesa*, Meig.); and *Zygoneura*, Meig. He omits the genera

*Heteropeza*, Winn. (Stett. E.Z. VII., 1846) and *Spaniocera*, Winn. (Linnaea Entom. VIII., 1853) having never had an opportunity of examining specimens; and he totally disregards those of Rondani for the reason that they were founded on too inexact observations. Meinert's genus *Miastor* [Naturh. Tidssk. (3) iii.] was not established until 1864, two years after the publication of Loew's monograph. Reverting to Baron Osten-Sacken's work it is found that the method of classification he employs is derived chiefly from those of Winnertz and Loew, as above tabulated; but in order to better compare the three it is desirable to append that of the Baron, more particularly as it is mainly from these three authors that the arrangement followed in the present paper is derived, there being no reason to deviate much from the system applied by, and the result of much labour on the part of, these proficient Dipterologists; it stands thus:—

#### Section I. CECIDOMYINA, Loew.

CECIDOMYIA, Meig.—Three or four longitudinal veins; in the first case the third vein is forked, thus representing the third and fourth veins, which are coalescent in the greater part of their extent; in some rare cases a branch of this fork or the whole fork becomes obsolete; in the second case all the four veins are simple. Surface of the wings hairy; margins with long cilia. Antennæ long, moniliform or cylindrical, generally verticillate, seldom without verticils, from 13- to 36-jointed.

SPANIOCERA, Winn.—Three longitudinal veins, which are all simple (not forked); the first close by the costa, the second at some distance from it, but reaching the margin of the wing before its tip. Hairs on the surface of the wing scaly. Antennæ filiform, 13-jointed, joints elongated, cylindrical, with a short pubescence and without verticils.

LASIOPTERA, Meig.—Three longitudinal veins, the first and second of which run very near the costa, and are so closely approximated as to be hardly discernible. Wings rather short and broad. Antennæ from 16- to 26-jointed; joints subglobular,



sessile, with short verticils. (The sub-genus *Clinorhyncha*, Loew, has been formed of the *Lasioptera* having the mouth prolonged in a rostrum.)

CECIDOMYIA, Meigen.

I. Wings with three longitudinal veins, the third either forming a fork, or becoming more or less obsolete towards the tip.

A. Cross-vein placed between the root and the tip of the first longitudinal vein (in this section the cross-vein is frequently almost obsolete).

*Cecidomyia*, Loew.—The second longitudinal vein reaches the margin of the wing a little before its tip (although in most cases the distance is very short). Generally the same number of joints in the antennæ of the ♂ and ♀; joints either pedicelled or sessile (sometimes pedicelled in the ♂ and sessile in the ♀; sometimes of the same structure, pedicelled or sessile, in both sexes).

*Diplosis*, Loew.—The second longitudinal vein reaches the margin of the wing at or beyond its tip. Antennæ of the ♂ 26- (2 + 24) jointed, sometimes with one rudimental joint more; joints pedicelled, simple joints alternating with double ones, seldom all joints simple. Antennæ of the ♀ 14- (2 + 12) jointed, sometimes with one rudimental joint more; joints pedicelled, cylindrical.

*Asphondylia*, Loew.—The second longitudinal vein reaches the margin of the wing a little beyond its tip. Antennæ of both sexes with the same number of joints; the latter cylindrical, sessile, with a short pubescence and without verticils.

*Hormomyia*, Loew.—The second longitudinal vein reaches the margin of the wing either at or beyond the tip. Thorax more or less gibbose, frequently extending over the head in the form of a hood. Joints of the ♂ antennæ pedicelled; those of the ♀ pedicelled or sessile.

*Colpodia*, Winn.—The second longitudinal vein forms a curve before the cross-vein and joins the margin a little beyond the tip of the wing. Cross-vein rather large, oblique.

B. Cross-vein very oblique, originating at the root of the first longitudinal vein.

*Dirhiza*, Loew.—Second longitudinal vein hardly undulating before the cross-vein; joints of the antennæ sessile or almost sessile in both sexes.

*Epidosis*, Loew.—Second longitudinal vein sinuose before the cross-vein; joints of the antennæ pedicelled in both sexes; their number variable.

## II. Wings with four longitudinal veins.

*Asynapta*, Loew.—The cross-vein is sometimes like that in section A, and then the second longitudinal vein is not sinuated; sometimes as in section B, then the second longitudinal vein is sinuated, like in *Epidosis*; in this case also the collare is a little prolonged.

## SPANIOCERA, Winnertz.

### LASIOPTERA, Meigen.

*Clinorhyncha*, Loew. Mouth prolonged in a rostrum.

## Section II. ANARETINA, Loew.

I. Ocelli extant; wings bare or almost bare; third longitudinal vein forked, the two following veins simple.

ZYGONEURA, Meig.—Antennæ 16-jointed; ♂ verticillate, joints pedicelled; ♀ pubescent, joints sessile; branches of the fork of the third longitudinal vein very arcuated at the base.

ANARETE, Hal.—Antennæ 9-jointed, short, slightly pubescent; joints subsessile, subglobose.

Wings pubescent.

Third longitudinal vein forked.

TRITOZYGA, Loew.—The upper branch of the fork forms a double curve, almost in the shape of an S.

CATOCHA, Hal.—The upper branch of the fork forms a single smooth curve; ♂ antennæ 16-jointed, verticillate, joints pedicelled; ♀ antennæ 10-jointed, pilose, joints moniliform.

CAMPYLOMYZA, Meig.—Fourth longitudinal vein forked; antennæ 11-20-jointed; ♂ moniliform, pilose; joints pedicelled; ♀ submoniliform, joints sessile, pubescent.

II. Ocelli wanting; third longitudinal vein forked; first longitudinal vein very short; wings pubescent; antennæ ♂ moniliform, verticillate; ♀ submoniliform, pubescent.

LESTREMIA, Macq.—Antennæ 16-jointed.

CECIDOGONA, Loew. Antennæ 11-jointed.

Both authors regarded this classification of the section ANARETINA as very imperfect, and indeed these insects were only considered provisionally as a section of the Cecidomyidæ, so little was known about them.

Winnertz in 1867 (Beit. zu einer Mon. der Sciarinen) includes *Zygoneura* amongst the genera of his new group, most of which were previously embodied in Mycetophilidæ. The characters of *Zygoneura* almost agree with those of *Sciara*, and the venation of the wings shows a decided relationship.

Whether I am right or wrong in accepting the genus *Cecidogona* it is not easy for me to decide; for although Prof. Loew (Stett. E.Z. 1844, p. 324) declares it to be without ocelli, Dr. Schiner seems to regard it as synonymous with *Lestremia*, and so also evidently does Winnertz (V. z-b. G. 1870, p. 35); and as if to further obscure the truth, Baron O.-Saacken places both genera in one division, characterised "ocelli wanting," notwithstanding Prof. Loew in the introductory portion of the same volume states that in all the genera in his section ANARETINA, with the single exception of *Cecidogona*, there are distinct ocelli. If *Cecidogona* does not possess ocelli, and it is difficult to believe, if these did exist, that they could have escaped the observation of Prof. Loew, then that genus is certainly valid, and distinct from *Lestremia*, which is wanting in ocelli; therefore I cannot feel justified in

rejecting the genus. Even if *Anarete* is not a doubtful genus, it cannot be received into this family.

In 1870, Winnertz (Verh. z.-b. Ges. in Wien, XX.) published a paper on these troublesome species, and located them in a separate group which he calls by the old name LESTREMINÆ, and he admits the genera *Campylomyza*, *Micromyia*, *Catocha*, and *Lestremia*. They consist, in his opinion, of transitional forms between the Cecidomyidæ and the Mycetophilidæ, differing from the former by the existence of ocelli, in the not shortened tarsi (with only a few exceptions), and in the more elaborate vein-system of the wings. And, as in *Campylomyza* and *Micromyia*, the species approach the section CECIDOMYINA; so they form a natural transition to the Sciaridæ by the ocelli, which are extremely small in *Lestremia*. Now all this seems to point to a separation, but I cannot disconnect *Campylomyza* or therefore *Micromyia* (which latter I regard, with Dr. Schiner, as belonging to *Campylomyza*) from Cecidomyidæ; an examination of the antennæ, venation of the wings, and the habits of the insects themselves would alone preclude that. Time may reveal to us new forms which may bridge over the gap between the two sections, or have the reverse effect; but for the present, I for one, shall include LESTREMINA as a sub-family of Cecidomyidæ; not omitting from it Loew's *Tritozyga*, an undoubtedly well-marked genus approaching *Campylomyza*.

A large number of genera in both sections, by different authors have been disallowed for various reasons; but it is unnecessary to mention them all here. *Villigera* even turned out to be a Coccid and no Cecidomyid at all! However by some chance (probably not having seen the publications), I may here unfortunately omit good genera, but should that be so I am sure the number would be very small. I have never seen more than the name of Stephen's *Dionmyza*, and so am compelled to exclude that genus from want of information.

I shall divide the Cecidomyidæ in the first place into two sub-families CECIDOMYINA and LESTREMINA, and the whole may be taken as follows:—

## Sub-family I. CECIDOMYINA.

- Genus 1. Heteropeza (Wtz.)  
2. Miastor (Mein.)  
3. Cecidomyia (Meig.)

## Section I.

*Sub-section A.*

- Sub-genus Gonioelema (s.-g.n.)  
Cecidomyia (Loew)  
Diplosis (Loew)  
Asphondylia (Loew)  
Hormomyia (Loew)  
Necrophlebia (s.-g.n.)  
Chastomera (s.-g.n.)  
Colpodia (Winn.)

*Sub-section B.*

- Dirhiza (Loew)  
Epidosis (Loew)

## Section II.

- Sub-genus Asynapta (Loew)  
Genus 4. Spaniocera (Winn.)  
5. Lasioptera (Meig.)  
Sub-genus Clinorhyncha (Loew)

## Sub-family II. LESTREMINA.

- Genus 1. Campylomyza (Meig.)  
2. Tritozyga (Loew)  
3. Catocha (Hal.)  
4. Lestremia (Macq.)  
5. Cecidogona (Loew)

Besides the above divisions the species will be distributed according to Winnertz and Loew; and in order to present the whole system, I shall in the following pages insert all the genera, sub-genera, with their lesser divisions, in their respective positions, even though I may have no examples to represent them.

## CHARACTERS OF THE FAMILY.

## THE TRANSFORMATIONS.

I. *Ovum.*

The egg is longer than broad, the ends rounded, orange-red, yellow, or whitish. The nidus for the egg may be any part of a plant according to the habits of the species; some appear to simply deposit the eggs on the surface, many to sink them into a puncture in the surface, and others singly or grouped together under the bark of large trees. The time when the eggs are laid is probably generally early morning or in the evening. A few days as a rule elapse before the young larvæ emerge, but this is to a great extent influenced by the weather; in some cases the hatching is accomplished in a few hours. Prof. Loew is of opinion that species having but one yearly generation remain a considerable length of time in the egg state.

II. *Larva.*

The young larva is of an elongate slender form, almost transparent; and the colour of the same species visibly changes with the increase of age, varying from orange or pinkish through different shades of red, or perhaps becoming light yellow or whitish. The body is composed of 14 segments, of which the head is regarded as the first. Between this and the thoracic segments is situated a joint which has been considered as either belonging to the head or to the thoracic region. Three segments are allotted to the thoracic, and the nine remaining to the abdominal division. Stigmata placed one pair on the first thoracic segment, and a pair on each of the abdominal segments except the last, appearing as more or less nipple-shaped prominences. The last two sometimes project considerably more than the preceding ones, and are occasionally removed towards the middle of the segment. Integument diaphanous, generally finely shagreened.



Head small, retractile, provided with a pair of two-jointed rudimentary antennæ, and a soft fleshy protuberance regarded by Ratzeburg as the labium. A slender coriaceous or corneous organ rooted in the first thoracic segment and projecting anteriorly, terminating just behind the head, is styled the breastbone. "This organ," remarks Baron Osten-Sacken, "the use of or the homology of which is unknown, is peculiar to the larvæ of *Cecidomyia*, and seems to be seldom wanting. It may be that this organ is used for locomotion, although I hardly would consider it as homologous with the pseudopods of the larvæ of *Chironomus* and *Ceratopogon*. If the supplementary segment (between the head and thoracic division) be considered as a part of the head, this breastbone might be taken for the mentum, in analogy to the horny mentum of the larvæ of the *Tipulariæ*. The form of this organ is variable in different species; sometimes it ends anteriorly in two points, with an excavation between them; sometimes in one elongated point; or it is serrated, etc." The terminal body segment is frequently provided with stiff or horny processes, which are employed, by some species at least, as saltatorial organs. The motions of the larvæ are in the majority of cases very slow indeed, though in some few species considerably accelerated by the provision of pointed projections, or in some cases even pseudopods, on the underside of the thoracic and abdominal segments.

In order to undergo its next metamorphosis the larva may leave the gall or malformation it inhabits, and bury itself in the ground; or it may inclose itself in a cocoon on the surface of a leaf, or hide beneath dry bark, in rotten wood, under leaves, &c., according to the species. *Lasioptera vastatrix* never once leaves the grass-stem in which it is deposited as an egg, until it assumes the imago state, and previous to turning into the chrysalis spins for itself a filmy silken cocoon. Winnertz remarks that although it is true that almost all the species belonging to the sub-genus *Cecidomyia* lie in the pupa state in a white cocoon, he could not convince himself that any cocoon was constructed of a veritable thread-work, not even in the case of *C. pini*, which Dr. Loew contended

was undoubtedly thread-work, but that the cocoon became deposited around the insect in crystalline form, without the larva betraying the slightest movement. The cocoon is ready after a few days, and even then under a high magnifying power no proper thread can be noticed. It is doubtful if the larvæ of the Cecidomyidæ undergo moultings. I believe that the length of time they remain in the larval form depends very much on the weather. They may be kept for months in that state in a dark box, but will emerge if restored to ordinary conditions. All are very liable to the attacks of parasitic Hymenoptera belonging to the family Proctotrupidæ.

About thirty years ago, Dr. Wagner, then Professor of Zoology in the University of Kasan, observed an asexual reproduction in the larvæ of a certain Cecidomyid. His observations were at first regarded as apparently "almost incredible," but were afterwards confirmed by the researches of Meinert, Pagenstecher, Loew, and other authors; and, according to their investigations, this "alternation of generation" (doubtless *frequently* occurring throughout the Cecidomyidæ), greatly resembles the mode of reproduction long before known to prevail in the Aphides.

Unfortunately, I have not yet been able to observe these germs in Cecidomyian larvæ, and must, for the present, refer those who desire to know more about this remarkable phenomenon, to the numerous papers which have been published from time to time, on this subject.

### III. *Pupa.*

The pupa is smooth or minutely granulate (the dorsal abdominal segments often spined) and bears a considerable resemblance to the perfect insect, the eyes, head, thorax, antennæ, and feet being distinctly determinable, even to the joints of the two latter. The bases of the antennæ are frequently produced in points; these are long, hornlike, and close together, or short and wide apart. Two pairs of bristle-like processes appear in most pupæ, one on the head near the hornlike points, and the second pair on the thorax,

which some authors have made out to be the stigmata of the pupa. Winnertz suggests that certain tooth-like projections on the pupa may serve for breaking through the cocoon; in many cases after the escape of the imago the pupa skin is to be found hanging outside the gall. The number of the abdominal segments is nine, counting the anal joint, or that containing the genital organs. These insects ordinarily continue a very brief time in this state. The pupæ of the celebrated Hessian fly [*Cecidomyia* (*Diplosis*) *destructor*] are known as the "flax-seed" stage of that fly.

#### IV. *Habits and habitats of the perfect insects.*

In the perfect state I believe the majority of Cecidomyidæ live but a very short time, though individuals of some few species I know are obtainable for two or three months. In Australia these flies may be found throughout the year, but they abound mostly during the early spring—August and September. They do not vary very considerably in their modes of flight, and the majority seem to resort to some shady retreat during the heat of the day, such as the interiors of caves, the crevices in the rough bark of trees, &c.; towards evening they frequently fly into houses, and may be seen vivaciously fluttering up and down the window panes not directly exposed to the sunlight, apparently all the while just touching the glass with their fore-legs and butting with their head as they proceed, and by that means possibly accelerating their pace; after dark, like many other insects, they are attracted by artificial light. I have seen a few species leisurely hovering over the tops of low shrubs in the fullest heat of the day, evidently preferring sun-shine to shade. Some only travel a very limited distance; one species which I have noticed in very short grass quite open to the sun in the midst of the summer, appeared never to fly for more than a few seconds at a stretch, and then only to reach a spot not more than twelve inches from its previous position. The flight never appears to be along in a direct line, but is an irregular dancing movement, totally precluding any sort of conjecture as to the direction

in which the insect will eventually alight. A great number, if not the majority, of species have a peculiar proclivity for spiders'-webs, and this is particularly noticeable in the numerous caverns, and under the overhanging rocks, on the Blue Mountains, and elsewhere, where the spiders have from crag to crag stretched their long threads of silk. In such secluded nooks and corners *Cecidomyidæ* may be seen sometimes in tens of thousands suspended closely side by side along the lines, evidently reposing, but commencing immediately, when approached, a peculiar oscillating movement which tends to render the insects themselves at the best only indistinctly visible on account of the rapid tremor, and very similar to the vibratory motion produced by an alarmed spider from the centre of its geometrical snare, or the long-legged *Tipulidæ* when at rest on a wall. In all these cases the motion seems to be equally a stratagem employed for protection,—in other words, a manœuvre whereby to escape the observation of their enemies.

It is worthy of notice, too, that the *Cecidomyidæ* perfectly ignore both the purpose of the cobwebs and the nature of their dangerous proprietors; never once have I, or has Mr. Masters, observed any of their remains ensnared, nor do the spiders appear to trouble themselves one iota about these small flies, which suddenly take wing on the least apprehension of danger. Notwithstanding the insignificant size of the generality of the gall-gnats, if a considerable number of festoons be disturbed, the hitherto silent cave soon reverberates with the harmonious hum produced by the vibration of thousands of little wings.

I have but rarely seen a *Cecidomyid* walking, that is, quietly travelling without using the wings; or standing at rest on a solid or hard foundation, if there was the smallest film of cob-web on which to hang, within reach.

The *Cecidomyidæ*,\* or gall-gnats, as their name implies, attack plants, thereby causing excrescences or distortions of the particular

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\* From *κηκίς*, a gall; *μύια*, musca, a fly.

part in which the female inserts her ovipositor and deposits her eggs. Although many of these excrescences offer a striking analogy to those of the true Hymenopterous gall-flies (Cynipidæ), many of the deformations, as, for instance, some to be observed in leaves, are merely discolourations and rolls, while *Lasioptera vastatrix*, a native of this country, simply causes a slight swelling of a portion of the skin; still all the deformations are commonly regarded as galls, however erroneously, and are spoken of as such. Different species are said to attack different plants, or unfrequently an allied species of plant, and each gall-gnat infests only a particular part of the plant, whether it be root, stem, flower or fruit.

The list given by Julius E. von Bergenstamm and Paul Löw (Synopsis Cecidomyidarum, Verh. z-b. Ges. Wien, XXVI, 1876), shows from the variety there recorded, that almost every family of plants probably furnishes sustenance to the larvæ of gall-gnats. In the same highly invaluable paper 463 species of Cecidomyidæ are catalogued, being the total then described from all parts of the globe; probably that number has doubled since then. Out of the 463, however, some are not known beyond the larval state, and the deformation they produce; and altogether, accounts of the economy and larvæ of something over a fourth part only have been published. Although the larva of a Cecidomyid is unmistakable, I do not think that the distinctions between those of different species are sufficient to warrant the bestowal of new names, and I much doubt if differences sometimes existing between the galls or malformations are very often sufficient criteria, yet of course it is constantly possible to decide that certain remarkable galls are the work of particular insects. Notwithstanding that a considerable amount has been written about this family by eminent men during the last 50 years, there is a very great deal yet to be done, and especially outside the more civilized portions of the world.

A few remarks may be added upon the geographical distribution of Cecidomyidæ.

Species of the genus *Cecidomyia* have been described from almost all parts of the world—in Europe, from Lapland and



Russia to Italy; from Egypt and the Cape of Good Hope; from North and South America, Borneo, and Australia; and *Lasioptera* is known to have nearly an equally wide range; and I believe that when the family has been equally studied in all countries, most if not all the genera and subgenera will be found represented all over the world; and though many forms may yet be discovered peculiar to certain countries, it is not probable that they will very greatly differ from known examples. The small species belonging to *Heteropeza*, *Miastor*, and *Campylomyza*, scarcely visible when on the wing, have been discovered in the widely-separated continents of Europe and Australia, and the last of these also from America; so, doubtless, they exist in Africa and elsewhere. A few species are common to America and Europe, but these evidently have been conveyed through the medium of commerce from one country to the other, through the introduction of the food plant.\* According to Prof. Hutton, Cecidomyidæ are represented in New Zealand, but, like many of the other smaller insects, have never yet been described from that country. Certain it is, that the family is scattered far and wide over the whole globe. Examples are to be found in quite different, indeed opposite climates, with widely distinct floras, and therefore supporting perfectly indigenous species of gall-gnats. The sub-genera *Cecidomyia* and *Epidosis* are not only known to occur in widely remote latitudes, but they have been also detected in amber, which, although a fossil resin, is not regarded geologically as a very ancient product. Cecidomyidæ probably existed much earlier—undoubted remains of numerous Diptera have been found in the well-known Stonefield slate and lias of the Mesozoic ages. The apparently extinct genus *Monodicrana* has been established for a species described by Prof. Loew in 1850 from amber, and found associated with *Cecidomyia* and *Epidosis*.

That the species of this family all originated from a common centre, from a common stock, and since become widespread, is I think indisputable, but our present knowledge is insufficient to

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\* Since this paper was written, the Hessian fly has also been reported as causing much damage in the Wellington district, New Zealand.



enable us to form any adequate opinion from whence they originated, or in which direction they travelled, though we may have some vague notion how they have become dispersed. It is obviously highly improbable that these small frail flies could have migrated across the wide tracts of water now separating certain countries, but became distributed at some period during which these watery barriers dividing or completely isolating land at the present day, did not exist. If we consider the changes this earth's surface has undergone, and remember that in the Triassic period for instance the island-continent of Australia was part of the Palæarctic or Asiatic mainland, and that at that time the land was not broken up into the islands of the Eastern Archipelago, thus affording an opportunity for migration, some little light may be thrown on this interesting subject, which, however, cannot be further pursued in the present paper.

#### V. *Imago.*

##### *External structure.*

The head is small, above broader than long, round when viewed from the front. Eyes generally lunate or reniform, more or less contiguous on the front. Ocelli wanting in the sub-family CECIDOMYINA, but extant in the LESTREMINA. Proboscis short, thick, fleshy, directed towards the pectus. Palpi prominent, four-jointed, the first joint short, the last usually longest. Antennæ long, moniliform or cylindrical, generally verticillate-pilose, seldom without verticils, 10- to 36-jointed, of which the two basal joints are more or less cupuliform; flagellar joints sometimes pedicelled in the ♂ and sessile in the ♀; sometimes of the same structure, pedicelled or sessile, in both sexes. The thorax roundish, in some species gibbose, sometimes extending over the head in the form of a hood; without a transverse suture. Halteres never completely bare, often considerably haired or scaled; the stalk long and slender; club large. Legs generally very long and slender. Coxæ short; femora not thickened; tibiæ without spurs; tarsi five-jointed; the metatarsal joint much shortened in the first

sub-family. The claws weakly developed, with apparently only one cushion. Wings incumbent; proportionately large and broad, rounded at the apex, cuneiformly narrowed at the base; as a rule hyaline though sometimes pellucid, with a pale bluish or brownish tint, generally beautifully iridescent; sometimes marmorated; more or less covered with irregularly arranged hairs; occasionally scaly; all the anterior margin scaly; deeply ciliated at the apex and on the posterior margin. The number of longitudinal veins amounts to at least two or at most five, never less than four in the second sub-family, or more than four in the first sub-family. In both sub-families the last two longitudinal veins often coalesce for the first half of their length, forming beyond a more or less distinct fork. The additional longitudinal vein of the *LESTREMINA* is inserted between the second and third veins of the first sub-family, and is furcate in all genera but *Campylomyza*. A longitudinal wing-fold generally has its position just in front of the third longitudinal vein, and often partially encloses the latter, or less frequently totally excludes it from view. No species has more than one transverse or cross-vein, which lies between the first and second longitudinal veins, but it is frequently most indistinct, or sometimes altogether wanting. Abdomen elongate, composed of nine segments; in the ♂ cylindrical, provided with large holding forceps; in the ♀ acuminate, with a protruding or non-protruding ovipositor, rarely without two small lamellæ; the whole body with a covering of fine delicate hairs, or less frequently scales or scaly hairs, the latter occurring more often on the under surface of the abdomen and legs.

The prevailing body-colours seem to be shades of yellow and red, darkening into brown proportionately as the integument becomes more horny. The expanse of the largest species exceeds four lines, that of the smallest less than a line. Regarding the relative number of the two sexes the females seem to be far more numerous than the males.

#### Sub-family I. CECIDOMYINA.

Wings with not more than four longitudinal veins, the two last frequently combining in the beginning of their course, forming a

more or less distinct fork; no ocelli; first tarsal joint much shortened.

Genus 1. HETEROPEZA, Winn.

Winnertz, Stett. E.Z. VII. 1846, p. 13; V. z.-b. G. Wien, 1870, p. 4, pl. 1.; Schiner, Fauna Austr. II. 1864, p. 410.

Antennæ in the ♂ moniliform, 2-+9-jointed, in the ♀ sessile, 2-+8-jointed; basal joint incrassate. Joints of the palpi of unequal length. Legs short; the third joint of the tarsi very long, the fourth and fifth short. Wings almost bare, with two longitudinal veins (Pl. II., fig. 1).

Very few species are known; others have probably escaped notice on account of their small size. All but the following, I believe, have been recorded from Europe. Although I have carefully searched for *H. transmarina* in the neighbourhood of Sydney, my endeavour to find it, or indeed any other member of the genus, has been hitherto unattended with success.

1. HETEROPEZA TRANSMARINA, Schiner.

*Heteropeza transmarina*, Schiner, Dipt. der Novara-Expedition, Zool. Theil. Bd. ii. p. 5, Taf. 1, fig. 1, ♀.

♀. "Bright reddish-yellow; the thorax blackish; the eyes black; the legs brownish-yellow, darker towards their extremity. Abdomen proportionally very long and slender. Ovipositor of the ♀ widely and very pointedly prominent, the first joint short, the second the longest of all. Antennæ brown, the first joint very large and thick, the others sessile, shortly oval. Legs delicate but distinctly hairy; the femora rather robust; the tibiæ long; the tarsi exceedingly short, consisting of four rudimentary joints, the fifth apparently deficient; the claws extremely small. Wings scarcely haired, not ciliated on the border; the sub-costal (first longitudinal) vein nearly reaches to the apex of the wing; the postical (second longitudinal) vein does not reach wing-margin.

Besides these two veins there is neither a wing-fold nor the rudiment of another vein."

<sup>1'''</sup><sub>6</sub> Sydney (November and December).

Bred by Frauenfeld from small excrescences on the leaves of a species of *Callistemon*.

## Genus 2. MIASTOR, Meinert.

Meinert, Nat. Tidskr. (3), III., 1864, p. 106; Schiner, V. z.-b. G. Wien, 1865, p. 87; H. Loew, Berl. E.Z. 1864, p. viii.; Winnertz, V. z.-b. G. Wien, 1870, p. 5, pl. 1.

Eyes separated in both sexes by a broad forehead. Antennæ 2-+11-jointed; the basal joints cupuliform; the flagellar joints in the ♂ ovate with short pedicels and long verticillate hairs, in the ♀ moniliform, sub-sessile, with short verticils. Prothorax arched. Legs slender in the ♂, shorter and more robust in the ♀; the tarsal joints of unequal length. Wings almost bare, appearing granulate under a high power; three longitudinal veins; cross-vein sometimes present (Pl. II., fig. 2).

This generic name I think at present does not designate more than half-a-dozen species, and those described below are the only ones I know occurring out of Europe. Some, if not all, of the species undergo their transformation under the bark of decaying timber.

## 2. MIASTOR PROCAX, sp.n.

♀.—Length of antennæ.....	0·012 inch	... 0·29 millimètre
Expanse of wings .....	0·035 × 0·010	... 0·88 × 0·25
Size of body .....	0·040 × 0·005	... 1·01 × 0·12

Antennæ about as long as the thorax, joints globose, pale brown, decreasing in size towards the tip, the last two joints somewhat elliptical; basal joints yellowish, second one larger than the first. Hypostoma and palpi pale brown; front darker. Thorax chestnut brown, nitidous, with pale hairs; pleuræ yellowish tinged with brown. Halteres with a very large pyriform club, stalk yellowish-brown, club bright reddish-brown, with a dispersed pale

pubescence. Abdomen about three times as long as the thorax, pale yellow, ovipositor light umber brown. Legs brownish-yellow. First, third, and fifth joints of the tarsi of about equal length, and one and a half times the length of the fourth joint; second joint one and a half times the length of the first. Wings with a few decumbent hairs along the first and second longitudinal veins, also towards the end of the third longitudinal vein, and a few more dispersed close to the wing-margin at the tip. Veins very pale and indistinct. First longitudinal vein only just visible at either end; second longitudinal vein apparently starting under the middle of the first longitudinal, almost straight, disappearing a short distance from the apex, which it would meet if continued; third longitudinal vein running from the base of the wing close and almost parallel to the posterior border, joining about mid-way to the tip of the wing. Fringe long and fine, not dense. (Description drawn from fresh specimen).

*Hab.*—Elizabeth Bay, near Sydney (Skuse). Beginning of January.

### 3. *MIASTOR MASTERSI*, sp.n.

♂.—Length of antennæ..... 0.025 inch ... 0.62 millimètre.

Expanse of wings.....  $0.035 \times 0.010$  ...  $0.88 \times 0.25$

Size of body.....  $0.030 \times 0.006$  ...  $0.76 \times 0.15$

Antennæ pale yellow, nearly as long as the body, joints elongate, oval; twice the length of the pedicels; last joint sessile; long verticillate hairs. Hypostoma and front yellowish-brown. Thorax yellow, levigate, appearing minutely granulate under a high power; two sparse rows of hairs from the collare to the scutellum; pleuræ and scutellum yellow. Halteres yellow whitish at the base, moderately haired; club large, pyriform. Abdomen with the first two or three segments yellow, the remainder dusky yellowish; moderately haired; forceps with a very minute silvery pubescence. Legs dusky yellow. First and fourth tarsal joints short, of the same length; third and fifth about the same length, longer than the



last ; second joint as long as the fourth and fifth together. Wings with a pale yellowish tint, more coarsely granulate than in *procax* ; a few hairs at the base and along the second longitudinal vein ; considerably fewer hairs on the wing than in *procax* ; pale silvery reflection. First longitudinal vein very indistinct, extending about half-way to the tip of the wing ; second longitudinal vein first visible close under the last at about two-thirds of its length, somewhat waving, disappearing some distance before the apex of the wing ; third longitudinal vein close to the posterior margin, very indistinct before joining. (Description drawn from fresh specimen).

*Hab.* —Elizabeth Bay (Skuse). February.

### Genus 3. CECIDOMYIA, Meig.

Meigen, Illig. Mag. II., 1803, p. 261 ; Macquart, S. à B. I., 1834, p. 159, pl. IV., figs. 10-11 ; H. Loew, D.B. IV., 1850 ; Winnertz, Linn. Entom., 1853, p. 186 ; O. Sacken, M. Dipt. N. Amer., 1862, p. 175 ; Schiner, F.A. II., 1864, p. 369.

Antennæ long, moniliform or cylindrical, generally verticillate, rarely without verticils, from 2- + 9- to 2- + 36-jointed. Wings with three or four longitudinal veins ; generally a longitudinal fold between the second and third longitudinal vein (Pls. II. and III., figs. 3-16).

#### Section I.

Wings with three longitudinal veins, the third either forming a fork or becoming more or less obsolete towards the tip.

#### Sub-section A.

Cross-vein, if present, placed between the root and tip of the first longitudinal vein.

#### Sub-genus 1. GONIOCLEMA, sub-gen. nov.

Antennæ in the ♀ 2- + 11-jointed, joints pedicelled, sub-cylindrical ; verticillate-pilose. Second longitudinal vein reaching the margin at the apex of the wing ; cross-vein distinct ; third longitudinal vein not forked ; first, third, fourth, and fifth joints of the tarsi short (Pl. II., fig. 3).



## 4. GONIOCLEMA PAUXILLULA, sp.n.

♀.—Length of antennæ.....	0·015 inch	... 0·38 millimètre.
Expanse of wings .....	0·036 × 0·015	... 0·90 × 0·30
Size of body.....	0·025 × 0·005	... 0·62 × 0·12

Antennæ about as long as the thorax, joints sub-cylindrical, almost sub-globose; terminal joints somewhat decreasing in size; separated by pedicels rather more than half the length of the joints; verticillate-pilose; yellowish; second basal joint much smaller than the first. Hypostoma and front pale brownish yellow; palpi yellowish. Eyes belting, contiguous on the front. Thorax sordid yellow, nitidous, with a few hairs along two pale, very indistinct lines, from the collare, meeting at a point at the scutellum; collare and pleuræ sordid yellow, somewhat paler than the thorax; scutellum large, almost semi-circular, sordid yellow. Halteres large, yellowish, with a few hairs. Abdomen about twice as long as the thorax, pale yellow, with a sparse pubescence; ovipositor short. Legs short, rather slender, pale yellow, with brownish hairs; the first, third, fourth and fifth joints of the tarsi short, second joint almost three times as long as the first. Wings pellucid, with a very pale bluish tint, rather thickly haired; very little reflection. First longitudinal vein very close to the costa, and scarcely distinguishable from it except for a short distance past the transverse vein; second longitudinal vein straight from the transverse vein, reaching the margin of the wing at the apex; third longitudinal not forked and not reaching the posterior margin. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Skuse). September.

*Obs.*—I have only seen a single specimen of this distinct form.

## Sub-genus 2. CECIDOMYIA, Loew.

Antennæ 2- + 9- to 2- + 22-jointed; generally the same number of joints in those of the ♂ and ♀; joints pedicelled or sessile alike in both sexes, or pedicelled in the ♂ and sessile in the ♀. Second longitudinal vein reaching the margin of the wing before the apex (Pl. II., figs. 4 and 5).

a. *Flagellar joints of the antennæ pedicelled in the ♂, and sessile in the ♀.*

5. *CECIDOMYIA FRAUENFELDI*, Schiner.

*Cecidomyia Frauenfeldi*, Schiner, Diptera der Novara-Expedition, Zool. Theil. Bd. II. p. 7. Taf. 1, fig. 7, ♂.

♂ and ♀.—“Pale reddish-yellow; the thorax dark brown, almost imperceptibly hoary; the abdomen more or less clouded with black on the upper side, always lighter between the segments. These cloudings of the abdomen show always in a greater degree in the ♂ than in the ♀. The anal appendages of the ♀ split, clubbed. The ovipositor of the ♀ much projecting, sharp, pointed, the last joint dark brown. Antennæ brownish-yellow, 2- + 18-jointed (these were the numbers counted in the ♀, the antennæ of all the ♂ examples had the tip broken off and the most perfect had only 17 joints), the joints in the ♂ globose and pedicelled, the pedicel as long as the joint, in the ♀ sessile, somewhat depressed in the middle; the joints with long verticils. Legs pale yellowish, the hindmost very long. Wings with pale-yellow pubescence and yellowish-brown veins; the sub-costal (first longitudinal) vein before the middle of the wing; the cubital (second longitudinal) vein joining the margin well before the apex of the wing, its basal part near the base of the wing very indistinct; the postical (third longitudinal) vein beyond the middle of the wing forked, the upper (anterior) branch set on the posterior branch, then curved forwards, the under (posterior) branch slightly waving, verging into the margin before the middle of the wing.”

$\frac{3}{4}$ —1". Sydney. November 6th to December 6th.

“Almost exactly like *C. circinas*, Giraud.”

According to Schiner's note appended to the description of this species, Frauenfeld bred specimens from rosette-like malformations covering the swollen branch buds of a species of *Melaleuca* found at “Naraby Lagoon,”\* Port Jackson. The fly emerged from the pupa in about 14 days.

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\* Frauenfeld evidently means Narrabeen Lagoon.

6. *CECIDOMYIA VITULANS*, sp.n.

♂.—Length of antennæ ...	0·018 inch	...	0·44 millimètre.
Expanse of wings .....	0·035 × 0·015	...	0·88 × 0·38
Size of body .....	0·035 × 0·010	...	0·88 × 0·25

Antennæ dark-brown, 2-+9-jointed, joints twice as long as broad, almost cylindrical; pedicels very short; verticils somewhat dense, long. Hypostoma and front brown. Vertex covered with small yellowish scales; a few long erect hairs. Thorax dark brown, nitidous, with two rows of rather long yellow hairs from the humeri to the scutellum; collare dark brown; pleuræ sordid yellowish-brown; scutellum dark reddish-brown, with some yellowish hairs. Halteres yellowish at the base, the club with black or dark brown scales. Abdomen sordid yellowish-brown; dorsal segments with numerous small brown scales. Legs short and rather robust, yellowish-white, sericeous; the tarsi dusky. Wings pale reddish-brown at the base, densely clothed with a short pubescence, deeply ciliated along the posterior margin, and having a brassy reflection. First longitudinal vein close to the costa; cross-vein very indistinct; second longitudinal vein pale brown, very strong, curved anteriorly, reaching the wing-margin much before the tip; third longitudinal pale brown, with the anterior branch very indistinct, almost invisible. (Description drawn from fresh specimen).

*Hab.*—Elizabeth Bay (Skuse). Beginning of December.

7. *CECIDOMYIA DIFFICILIS*, sp.n.

♀.—Length of antennæ .....	0·018 inch	...	0·45 millimètre.
Expanse of wings .....	0·055 × 0·020	...	0·39 × 0·50
Size of body .....	0·045 × 0·014	...	1·13 × 0·36

Antennæ light umber brown, 2-+12-jointed, joints sessile sub-cylindrical, the last one twice the length of the preceding, and appearing as if composed of two joints, verticillate-pilose. Palpi brownish-yellow. Yellowish hairs on the vertex. Thorax

deep reddish-brown, levigate, with two longitudinal rows of yellowish hairs running about parallel to one another from the collare to the scutellum; collare and pleuræ red; scutellum reddish-brown with yellowish hairs; metathorax red. Halteres pale reddish-brown, the tip of the club and base of the stalk yellowish; the club elongate. Abdomen red with darker scales, and a row of semi-erect hairs on the hind border of each segment; rather paler between the segments; ovipositor long, light umber brown, the point reddish-yellow. Legs short and slender. Fore coxæ sordid yellow; hind and middle coxæ reddish. Fore and middle femora and tibiæ, also the hind tibiæ, sordid yellow; hind femora reddish-yellow. Tarsi cinereous. Articulations tinged with reddish. Wings hyaline, with fine pale pubescence, and a pale rosy reflection when viewed at a certain obliquity. The costal and two first longitudinal veins chestnut-brown; second longitudinal strong, almost straight, joining the costal considerably before the apex of the wing; transverse vein almost invisible, not very oblique; third longitudinal vein most indistinct, anterior branch nearly straight. (Description drawn from fresh specimen).

*Hab.*—Elizabeth Bay (Masters). Beginning of January.

#### 8. CECIDOMYIA REGILLA, sp.n.

♀.—Length of antennæ.....	0·020 inch	...	0·50 millimètre.
Expanse of wings.....	0·040 × 0·017	...	1·01 × 0·42
Size of body .....	0·035 × 0·010	...	0·88 × 0·25

Antennæ pale-brown, 2-+11-jointed, joints cylindrical, sessile, one half longer than broad, verticils somewhat sparse, moderately long, greatly appressed to the joints longitudinally; terminal joint very little smaller than any of the preceding ones, without any terminal process. Hypostoma and front yellowish-brown. Palpi moderately long, slender, yellowish-brown. Thorax dull black, with two rows of yellowish-brown hairs extending from the humeri to the scutellum. Poisers short, thick, the stalk pale at the base, with a dense covering of short black squamose pubescence to the base of the club; club large, apex scattered with

scales. Abdomen light red, with darker dorsal bands, with a few scattered black scales; terminal segment densely scaled; ovipositor short; lamellæ indistinguishable. Legs rather short. Coxæ femora and tibiæ broad, slightly pubescent, with a few scales; yellow tinged with red. Tarsi short, covered with black scales. Wings rounded, very densely covered with a scaly pubescence; pellucid, with a pale bluish tint; brassy reflection. Veins pale brown. First longitudinal vein rather close to the costa, and not very distinct on account of the thick pubescence; second longitudinal vein a little sinuose before the cross-vein, bent anteriorly, joining the costal at a point three-fourths of the distance from the apex of the wing; cross-vein short, indistinct; third longitudinal vein with its anterior branch very indistinct. (Description drawn from fresh specimen).

*Hab.*—Elizabeth Bay (Skuse). End of January.

#### 9. *CECIDOMYIA BACCATA*, sp.n.

♂.—Length of antennæ.....	0·020 inch	...	0·50 millimètre.
Expanse of wings.....	0·035 × 0·015	...	0·88 × 0·38
Size of body.....	0·035 × 0·010	...	0·88 × 0·25

Antennæ dark-brown, 2- + 9-jointed, joints sub-cylindrical, about twice as long as the pedicels; pedicels paler than the joints, verticils pale brown, moderately dense, long; terminal joint apparently with a very small nipple-shaped projection. Hypostoma and front brown; the first joint of the palpi small; the second joint saffron-coloured and much longer; third joint paler, longer than the second; fourth joint pale yellow, slender, about twice as long as the second. Thorax black, nitidous, two rows of hairs with a pale reflection, the hinder half with an oblong patch of clavate scales, niveous, with pale pearly reflections when viewed at a certain obliquity, reaching its margin posteriorly, but not extending to the lateral margins; pleuræ umber brown. Halteres with the apex black, elongate, not much thickened, stem pale brown. Abdomen umber brown, thickly covered with scales and hair. Legs short and robust. Coxæ pale reddish-brown. Front femora yellowish for

the greater part of their length, extremity blackish; middle and hinder pair blackish, yellowish at the base. Tibiæ yellowish-white, sericeous. Tarsi black with a somewhat hoary reflection. Wings pale reddish-brown at the base, densely covered with scales and scaly hairs, a vertical band of broader scales from the costal to the anterior branch of the third longitudinal vein; deeply ciliated along the posterior margin from the tip to the base; and having a violaceous reflection from the base to the outside margin of the squamous band, the tip brassy. First longitudinal vein rather close to the costa; cross-vein very indistinct; second longitudinal vein strong, curved anteriorly, joining the costal margin some distance from the tip; third longitudinal thick at the base, anterior branch very indistinct. (Description drawn from fresh specimen).

*Hab.*—Elizabeth Bay (Skuse). Beginning of December.

#### 10. *CECIDOMYIA NOBILIS*, sp.n.

♂.—Length of antennæ.....	0·040 inch	...	1·01 millimètres.
Expanse of wings. ....	0·055 × 0·020	...	1·39 × 0·50
Size of body.....	0·050 × 0·010	...	1·27 × 0·25

Antennæ reddish-brown, 2- + 10-jointed, joints sub-cylindrical, nearly twice as long as broad, with long stiff verticillate hairs; pedicels pale, almost as long as the joints; terminal joint much larger and more slender than the preceding ones; basal joints paler, large. Hypostoma and front pale ferruginous. Palpi moderately long, pubescent, ferruginous. Thorax deep reddish-brown, with two rows of golden hairs from the humeri to the scutellum; humeri tipped with ochraceous-ferruginous; scutellum and pleuræ ferruginous-brown. Poisers short, yellow, the stalk and base of club with black scales; club pyriform. Abdomen ferruginous-ochraceous, with a pale pubescence; forceps sordid ochraceous, very densely haired. Legs moderately long, slender. Coxæ ferruginous. Femora ferruginous at the base, yellowish-white on the underside, and covered with deep brown scales and hairs on the upper side from the base to the tip. Tibiæ and



tarsi deep brown or black on account of their scales and hairs. Wings pellucid, with a very pale brownish tint, very densely haired and ciliated; bright bluish reflection. Venation pale and not very distinct. First longitudinal vein short, very close to the costa; second longitudinal vein very little bent posteriorly, reaching the margin immediately before apex of the wing; cross-vein not distinguishable; third longitudinal vein turning towards the posterior margin in an abrupt little rounded angle; anterior branch almost straight, most indistinct. (Description drawn from dried specimen).

*Hab.*—Gosford (Skuse). February.

*Obs.*—At first glance specimens of this insect bear a most striking resemblance to *Diplosis plumbea*.

#### 11. CECIDOMYIA GIBBULA, sp.n.

♀.—Length of antennæ..... 0·035 inch ... 0·88 millimètre.

Expanse of wings..... 0·090 × 0·040 ... 2·27 × 1·01

Size of body..... .. 0·070 × 0·020 ... 1·77 × 0·50

Antennæ blackish, 2- + 16-jointed, sessile, cylindrical, verticillate pilose. Hypostoma and front yellowish-brown; palpi grey, the fourth joint one-half longer than the third, second joint thicker than the rest. Thorax black, somewhat gibbose, levigate; scutellum sordid-yellow; pleuræ sordid-yellow, blackish at the base of the wings. Halteres yellowish, blackish at the base of the knob. Abdomen brownish-red, ovipositor long, yellowish. Coxæ yellowish-grey. Femora yellowish-grey, reddish at the tips. Tibiæ slightly reddish at the base, remainder of the joints and tarsi blackish, with a greyish reflection. Wings hyaline, with a yellowish pubescence, little reflection. Costal and two first longitudinal veins brownish; cross-vein very indistinct; first longitudinal vein so close to the costa as to be hardly discernible, a little divergent at the tip; third longitudinal indistinct. (Description drawn from dried specimen).

*Hab.*—Middle Harbour (Skuse).

b. *Flagellar joints of the antennæ stalked in the ♂ and ♀.*

c. *Flagellar joints of the antennæ sessile in the ♂ and ♀.*

## Sub-genus 3, DIPLOSIS, Loew.

*Diplosis*, H. Loew, D.B. IV. 1850, p. 20 ; Rondani, II.<sup>da</sup> Mem. Parma, 1840, &c. ; Winnertz, L.E., 1853, p. 187 ; O.-Sacken, Mon. Dipt. N. America, 1862, p. 176 ; Schiner, F.A., II. 1864, p. 382.

Second longitudinal vein reaching the margin of the wing either at or beyond the apex (Pl. II., figs. 6 and 7). Antennæ of the ♂ 2-+24-jointed ; joints pedicelled ; simple joints alternating with double ones or all the joints quite simple, in the latter case the joints having only one hair-whorl ; joints sometimes with the hair-whorls equally long on the upper and under sides, often decorated with long stiff hairs on the upper side. Antennæ of the ♀ 2-+12-jointed ; joints sub-sessile or having very short pedicels, cylindrical. Wings either unspotted or variegated.

A. SECOND LONGITUDINAL VEIN REACHING THE MARGIN OF THE WING AT OR BEFORE THE APEX.

1. Flagellar joints of the antennæ in the ♂ alternately single and double. (All ♀s with unspotted wings, the ♂s not being known are located provisionally in this group).

a. *Wings unspotted.*

12. DIPLOSIS LEPTOSPERMI, sp.n.

♂.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expanse of wings.....	0·070 × 0·035	...	1·77 × 0·88
Size of body.....	0·070 × 0·10	...	1·77 × 0·25

Antennæ pale brown, alternate joints one-half larger than the intermediate ones, sub-globose ; verticils short, dense ; pedicels shorter than the joints ; basal joints large. Hypostoma and front pale brown. Palpi short, slender, pale brown, with a minute yellowish pubescence. Thorax dull ochraceous-brown, yellow pubescence ; scutellum small, narrow, with a sparse yellowish pubescence ; pleuræ ochraceous, tinged with brown. Poisers ochraceous, densely pubescent ; stalk slender ; club large,

almost sub-globose. Abdomen ochraceous-brown, with a yellowish pubescence; forceps large, brown, pubescent. Legs short and slender. Coxæ and femora ochraceous, with yellow hairs. Tibiæ and tarsi ochraceous-brown. Wings very much rounded, pellucid, with a pale bluish tint, very densely haired, moderately ciliated, and having little or no reflection. Venation yellow. First longitudinal vein thick, slanting into the costa; second longitudinal vein nearly straight, pale at the base, reaching the wing-margin at the apex; cross-vein not distinguishable; third longitudinal vein arcuating wide of the margin before joining the posterior border; anterior branch very indistinct bending at first considerably upwards. (Description drawn from dried specimen).

*Hab.*—Sydney (Masters). Bred from malformed flowers of *Leptospermum* sp. in November.

### 13. DIPLOSION PLUMBEA, sp.n.

♂.—Length of antennæ.....	0·060 inch	...	1·54 millimètres.
Expanse of wings.....	0·060 × 0·030	...	1·54 × 0·76
Size of body.....	0·060 × 0·020	...	1·54 × 0·50
♀.—Length of antennæ.....	0·040 inch	...	1·01 millimètres.
Expanse of wings .....	0·080 × 0·035	...	2·02 × 0·88
Size of body.....	0·080 × 0·025	...	2·02 × 0·62

♂ and ♀. Antennæ greyish-ochraceous, basal joints dull ochraceous; verticils dense, short; ♂ the double joints becoming more divided as they proceed, so that a short pedicel appears between the two portions of the terminal joint, thus forming two distinct joints; gradually diminishing in size towards the tip; pedicels of the single ones increasing in length; last joint with a slender projection; ♀ cylindrical, on very short pedicels, terminal joint with a bud-shaped process. Hypostoma and front ochraceous; palpi very slender, ochraceous. Thorax pale reddish-brown, with two longitudinal rows of long hairs from the collare to the scutellum, also some erect hairs in front of the origin of the wings; pleuræ and collare ferruginous-ochraceous. Halteres ochraceous, pubescent.

Abdomen ochraceous; the second, third, fourth and fifth dorsal segments in the ♂ with a small indistinct ferruginous spot; reddish-ochraceous, with a distinct black spot on the third dorsal segment in the ♀; densely haired. Legs moderately long, slender. Coxæ and femora pale ochraceous; upper side and tip of femora and the remaining joints cinereous. Wings more rounded in the ♂, ferruginous at their insertion, hyaline, densely pubescent, and densely ciliated round the whole margin; surface appearing as if blacklead when viewed at a certain obliquity. Veins pale. The second longitudinal vein slightly curved posteriorly, joining the costal at the apex of the wing in ♂; almost straight, bent somewhat anteriorly towards its end in ♀, reaching the margin about the same point as that of ♂; cross-vein very indistinct; third longitudinal rather indistinct. (Description drawn from fresh specimens).

*Hab.*—Elizabeth Bay (Skuse). January.

*Obs.*—I found this in large numbers on some small cob-webs about the bases of the fronds of four species of tree-ferns [*Alsophila australis* (N.S.W.), *Cunninghami* (Gippsland), *Cooperi* (Norfolk Island), and *Cyathea medullaris* (New Zealand)], planted in Mr. Macleay's garden. They probably occupied such situations for shelter only.

#### 14. DIPLOSIS CONFINIS, sp.n.

♂—Length of antennæ ...	0·060 inch	...	1·54 millimètres.
Expanse of wings .....	0·060 × 0·030	...	1·54 × 0·76
Size of body .....	0·055 × 0·10	...	1·39 × 0·25

Antennæ ochraceous-brown, basal joints dull-ochraceous, verticils dense, pale; the double joints as in *D. plumbea* becoming more divided as they proceed, pedicels short. Hypostoma and front dull ochraceous. Thorax deep brown, almost black; humeri tinged with reddish; pleuræ and scutellum deep reddish-brown. Halteres ochraceous, reddish at the base, pubescent; club elongate, almost pyriform. Abdomen sordid ochraceous, without spots, densely pubescent; forceps hairy, ochraceous. Legs shorter than

in *D. plumbea*. Coxæ and femora red-ochraceous, the latter with a black line along the upper side. Remaining joints black, with a slight reddish tinge. Wings considerably rounded; almost hyaline; rather densely pubescent particularly towards the tip, moderately ciliated; displaying brilliant roseous, yellow, and chalybeous reflections when viewed in a certain light. First longitudinal vein short, close to the costa; cross-vein not apparent; second longitudinal vein nearly straight, joining the margin either at or immediately beyond the apex of the wing; third longitudinal vein indistinct. (Description drawn from fresh specimen).

*Hab.*—Sydney (Skuse). January.

*Obs.*—This species approaches *D. plumbea* very closely, but it is certainly distinct.

#### 15. DIPLOSIS BREVIPENNIS, sp.n.

♂.—Length of antennæ.....	0·060 inch	...	1·54 millimètres.
Expanse of wings.....	0·055 × 0·025	..	1·39 × 0·62
Size of body.....	0·060 × 0·015	...	1·54 × 0·38

Antennæ brownish, with short greyish-yellow verticils, basal joints yellowish-brown; joints of the flagellum somewhat longer than the pedicels; alternate joints about double the size of the intermediate ones, last joint ending in a very minute nipple-shaped appendage. Head black, with some long greyish-yellow hairs on the vertex. Palpi pinkish. Thorax deep reddish-brown, appearing almost black anteriorly, levigate, with two patches of greyish-yellow recumbent hairs, diverging from the humeri; collare deep reddish-brown; pleuræ light reddish-brown. Halteres pale reddish-brown. Abdomen light reddish-brown, paler between the segments, with greyish-yellow hairs; forceps deep brown, densely haired. Legs very short. Coxæ light reddish-brown. Femora tinged with light reddish-brown at the base, the middle greyish-yellow, and the tip dark reddish-brown. Tibiæ sordid greyish-yellow, whitish at the base, and pale reddish-brown at the extreme tip. Tarsi sordid greyish-yellow, with pale articulations, appearing cinereous when viewed in a certain light. Wings pale



reddish-brown at the base, pellucid, of a pale brownish tint, with pale pubescence, moderately ciliated on the posterior border, with violaceous and brassy reflections. Veins pale brownish; transverse vein indistinct; second longitudinal vein reaching the margin at the tip of the wing. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters). December.

#### 16. DIPLOSIS PERCITA, sp.n.

♀.—Length of antennæ .....	0.025 inch	...	0.62 millimètre.
Expanse of wings.....	0.070 × 0.030	...	1.77 × 0.76
Size of body .....	0.060 × 0.015	...	1.54 × 0.38

Antennæ greyish-brown, joints rather long, sub-sessile, cylindrical, with grey verticils; basal joints sub-globular, pale brownish, paler than the flagellar joints; last joint ending in a small cylindrical process about one quarter the length of the joint. Hypostoma, front, and palpi pale-brownish, about the same tint as the basal joints of the antennæ. Thorax greyish-brown, nitidous, with long erect yellow hairs; collare paler; pleuræ sordid-brown; scutellum pale reddish-brown, with long yellowish hairs. Halteres whitish at the base, the stem and club yellowish. Abdomen pale, greyish-brown, the dorsal segments banded with dark-brown, short yellow pubescence. Legs moderately long, slender, greyish, the tarsi with a dusky reflection. Wings pale reddish-brown at the base, pellucid, with a bluish tint, rather dense pubescence, well fringed, and having a bright brassy reflection. Veins pale brownish. Second longitudinal vein reaches the margin at the tip of the wing; cross-vein indistinct, not very oblique; third longitudinal very pale, straight until it branches, anterior branch curved slightly upwards at first, then running in a straight line. (Description drawn from fresh specimen).

*Hab.*—Elizabeth Bay (Skuse). December.

#### 17. DIPLOSIS SCENICA, sp.n.

♂.—Length of antennæ .....	0.060 inch	...	1.54 millimètres
Expanse of wings.....	0.050 × 0.025	...	1.27 × 0.62
Size of body.....	0.035 × 0.008	...	0.88 × 0.20



Antennæ greyish-brown, joints short, about as long as the pedicels; verticils very dense, moderately long; second basal joint ovate, much larger than the first or the flagellar joints; no apparent process to the terminal joint. Hypostoma and front yellowish. Thorax greyish-brown, nitidous, with somewhat long pale hairs; pleuræ and scutellum pale reddish-brown. Halteres whitish at the base, the club elongate, obscure. Abdomen pale reddish-brown, with a fine yellowish pubescence, and a black patch on the first two or three dorsal segments. Legs moderately long, slender, yellowish-white, thickly haired, with a dusky reflection. Wings pale reddish-brown at the base, densely clothed with a somewhat long and bent pubescence; deeply fringed from the tip, along the posterior margin, to the base; and having a brassy reflection. Veins pale brown. First longitudinal vein close to the costal; cross-veins rather indistinct; the second longitudinal vein almost straight, curved exteriorly towards its end, joining the costal immediately before the apex of the wing; third longitudinal vein straight until it branches, anterior branch indistinct, starting just above the curvation of the posterior branch. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters). September.

#### 18. DIPLOSIS LUCIDA, sp.n.

♂.—Length of antennæ.....	0.020 inch	...	0.50 millimètre.
Expanse of wings.....	0.050 × 0.020	...	1.27 × 0.50
Size of body.....	0.030 × 0.008	...	0.76 × 0.20

Antennæ greyish-brown, the basal joints pale brown, joints sub-sessile, cylindrical, verticillate-pilose. Hypostoma and front yellowish-brown; palpi paler. Thorax dark brown, nitidous, two rows of short hairs; pleuræ paler; collare yellowish-brown; scutellum pale brown, darker than the collare, covered with long erect hairs. Halteres brown at the base, stalk blackish, and the club whitish. Abdomen rather paler than the thorax, thickly covered with pale and somewhat long pubescence. Legs short. Coxæ brown. Femora pale brownish, with a black pubescence.

Tibiæ and tarsi cinereous. Wings pellucid, of a very pale yellowish tint, having a pale somewhat long and straight pubescence, and a cupreous reflection with a brilliant blue spot over the branch of the third longitudinal vein when held at a certain obliquity. Veins pale brownish. Costal with long erect hairs before the end of the first longitudinal vein; cross-vein pale, not very oblique; second longitudinal vein almost straight, joining the wing margin at the tip; third longitudinal pale and indistinct, particularly the anterior branch. (Description drawn from dried specimen).

*Hab.*—Woronora (Masters and Skuse).

#### 19. DIPLOSIS PAULA, sp.n.

♀.—Length of antennæ.....	0·020 inch	... 0·50 millimètre.
Expanse of wings .....	0·050 × 0·015	... 1·27 × 0·38
Size of body.....	0·040 × 0·006	... 1·01 × 0·15

Antennæ brown, joints cylindrical, twice as long as broad, subsessile, verticillate-pilose; terminal joint with a minute projection. Palpi pale brown. Hypostoma and front pale brown. Thorax nitidous, dark brown, two indistinct lines of paler brown with short pale hairs marking the divisions of the three usual stripes; humeri yellowish; pleuræ brown; scutellum prominent, ochraceous-brown. Poisers yellowish, white at the base; stem very slender, club large, pyriform, with a minute pubescence. Abdomen nitidous, ochraceous-brown, with a scattered yellowish pubescence; lamellæ elongate, yellowish. Legs moderately long, slender, yellowish grey, appearing darker on account of their pubescence. Wings pellucid, with a pale bluish tint; not very thickly haired; rosy and golden reflections. Veins yellowish-brown. Second longitudinal vein almost straight, reaching the margin before the apex of the wing; cross-vein distinct, not very oblique; third longitudinal vein indistinct, not turning abruptly towards the posterior border; anterior branch only bent at its base. (Description drawn from fresh specimen).

*Hab.*—Elizabeth Bay (Skuse). End of January.

## 20. DIPLOSIS ABBREVIATA, sp.n.

♀.—Length of antennæ.....	0·025 inch	...	0·62 millimètre.
Expanse of wings.....	0·040 × 0·015	...	1·01 × 0·38
Size of body.....	0·045 × 0·010	...	1·13 × 0·25

Antennæ grey, sub-cylindrical, joints somewhat darker than the pedicels, basal joints large, sub-globular, very pale, almost white, terminal joint apparently in an imperfectly developed condition, more slender than the preceding, verticils long, greyish. Head grey. Hypostoma and front yellowish; palpi pale, slender. Thorax yellowish-grey, nitidous, with two rows of long pale hairs from the collar to the scutellum; scutellum yellowish, haired; pleuræ pale yellowish-grey. Halteres bright yellow, stalk at base of knob darker. Abdomen reddish-yellow, covered with a fine pubescence; ovipositor short, very small oval yellow lamellæ. Legs short, uniform yellowish-grey, with a long pubescence on the femora and tibiæ, shorter on the tarsi. Wings pellucid, with a very pale bluish tint, thickly haired, and having a pale brassy reflection; fringe long. Veins yellowish; first longitudinal close to the costa; second longitudinal vein almost straight; cross-vein indistinct; third longitudinal most indistinct, the anterior branch being next to invisible. (Description drawn from fresh specimen).

*Hab.*—Sydney (Skuse). November.

## 21. DIPLOSIS ARDENS, sp.n.

♀.—Length of antennæ.....	0·025 inch	...	0·62 millimètre.
Expanse of wings.....	0·045 × 0·020	...	1·13 × 0·50
Size of body.....	0·040 × 0·010	...	1·01 × 0·25

Antennæ brown, more than half as long as the wings, joints sub-sessile, cylindrical, about twice as long as broad, with yellowish verticils; terminal joint somewhat conical. Hypostoma and front brown. Palpi reddish-yellow. Thorax dull castaneous, with the two longitudinal rows of hairs sparse, yellowish; scutellum reddish-brown, with a yellowish tinge on the posterior

margin, and a yellowish pubescence; pleuræ bright red-brown. Poisers very little thickened at the apex, the stalk yellow, with a slight pubescence, apex whitish. Abdomen bright red-brown, the dorsal segments with considerably darker bands, but the brighter colour appearing between them, very little pubescence except on the terminal joint; lamellæ small, oval, bright yellow. Legs moderately long, slender. Coxæ ferruginous-yellow. Femora and tibiæ yellowish. Tarsi cinereous. Wings considerably pointed at the base, rounded at the apex, pellucid, with a very pale yellow tint; sparingly haired, thicker towards the tip; moderately and rather densely ciliated; surface with golden reflections when viewed at a certain obliquity. Veins pale brown. First longitudinal vein rather close to the costa, but quite distinct; second longitudinal vein straight, reaching the margin considerably before the apex; cross-vein absent; third longitudinal vein running very near the posterior margin, bent exteriorly just before the tip; anterior branch indistinct, straight. (Description drawn from dried specimen).

*Hab.*—Sydney (Skuse). January.

*Obs.*—I have never observed the ♂ although the ♀ forms seem numerous.

## 22. DIPLOSION CÆCA, sp.n.

♂.—Length of antennæ.....	0·045 inch	...	1·13 millimètres.
Expanse of wings.....	0·040 × 0·020	...	1·01 × 0·50
Size of body.....	0·020 × 0·006	...	0·50 × 0·15

Antennæ yellowish-grey, alternate joints one half larger than the intermediate ones, the basal portion paler, separated by pedicels about as long as the joints; verticils moderately long, bent; terminal joint with a pale slender pedicel-like projection. Front yellowish-brown. Palpi moderately long, yellowish-brown, with a sparse minute pubescence. Thorax light reddish-brown, nitidous, with a sparse long yellowish pubescence; scutellum yellowish-red; pleuræ ochraceous-brown. Halteres whitish, with a dusky pubescence, club elliptical, bare on the apex. Abdomen

dusky ochraceous-brown, with a dense yellowish pubescence; forceps small, densely surrounded by hair. Legs moderately long, very slender, almost cinereous; femora yellowish at the base. Wings rather pointed at the base, and considerably rounded at the apex, pellucid, with a pale bluish tint, densely and rather uniformly haired, though perhaps somewhat thicker towards the tip, densely ciliated, and having a pale brassy reflection. Veins yellowish. First longitudinal vein close to the costa; second longitudinal vein almost straight, reaching the margin of the wing immediately before the apex; cross vein absent; third longitudinal vein running rather close to the posterior margin, indistinct, without an anterior branch. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Skuse).

### 23. DIPLOSIS PROBATA sp.n.

♀.—Length of antennæ.....	0·020 inch	...	0·50 millimètre.
Expanse of wings.....	0·045 × 0·029	...	1·13 × 0·50
Size of body .....	0·040 × 0·010	...	1·13 × 0·50

Antennæ greyish-brown, half as long as the body; flagellar joints, sub-sessile, cylindrical, about twice as long as broad, with short verticils; basal joints yellowish-grey. Hypostoma and front yellowish-grey. Palpi moderately long, pale yellow, with a minute pubescence. Thorax light reddish-brown, nitidous, with a pale pubescence; scutellum almost lunate, pale yellow, with a sparse pubescence; pleuræ yellowish-grey. Halteres pale yellowish with a dusky pubescence, club pyriform. Abdomen yellowish-ferruginous, darker on the second and third dorsal segments; ovipositor short, lamellæ very small. Legs moderately long, very slender, uniformly cinereous. Wings very narrow at the base and greatly rounded at the apex, pellucid, with a very pale yellowish tint, somewhat sparingly haired, thicker towards the tip, and exhibiting a most brilliant golden reflection. Veins yellow. First longitudinal vein closely approximated to the costa; second longitudinal vein almost straight, bent

somewhat exteriorly at the tip, reaching the margin of the wing immediately before the apex; cross-vein rather indistinct, not very oblique; third longitudinal vein running very near the posterior margin, arcuated just before tip, indistinct; anterior branch absent. (Description drawn from dried specimen).

*Hab.*—Middle Harbour, near Sydney. (Masters and Skuse).  
August.

*Obs.*—Closely allied to *D. caeca*.

#### 24. DIPLOSIS VEGRANDIS, sp.n.

♂.—Length of antennæ.....	0·040 inch	...	1·01 millimètres.
Expanse of wings .....	0·035 × 0·017	...	0·88 × 0·42
Size of body.. .....	0·030 × 0·008	...	0·76 × 0·20
♀.—Length of antennæ.....	0·015 inch	...	0·38 millimètre.
Expanse of wings.....	0·040 × 0·015	...	1·01 × 0·38
Size of body .....	0·030 × 0·010	...	0·76 × 0·25

♂ and ♀. Antennæ brown, with greyish verticils; basal joints yellowish brown; ♂ alternate joints twice the size of the intermediate ones, the basal half of each joint pale like the pedicels; pedicels as long as the joints; ♀ cylindrical, sub-sessile. Front and mouth yellowish-brown. Palpi yellowish, short and slender. Thorax ochraceous-brown, nitidous, that of the ♀ with a reddish tinge; pale pubescence; humeri yellow; pleuræ somewhat reddish-yellow. Halteres yellowish with a greyish pubescence, club large. Abdomen reddish-yellow, with a conspicuous reddish-brown patch, generally on the first three or four dorsal segments, but sometimes extending further down the back, with a dense pale pubescence; ♂ forceps large, pale reddish-brown; ♀ ovipositor short, pale reddish-yellow. Legs moderately long, slender; about the same length in both sexes, if anything rather longer in ♂; greyish-yellow, with a cinereous pubescence, very dense on the tarsi making them appear considerably darker than the tibiæ and femora. Wings hyaline, clothed with long hairs, deeply ciliated, with a brassy reflection; in ♂ somewhat rounder and shorter. Veins pale yellowish. Two first longitudinal veins very distinct,



the second one slightly bending exteriorly, reaching the margin of the wing before the tip; cross-vein most indistinct; third longitudinal vein most indistinct, running close to the posterior border; the anterior branch entirely wanting in most specimens. (Description drawn from dried specimens).

*Hab.*—Elizabeth Bay (Masters and Skuse). January.

b. *Wings variegated.*

## 25. DIPLOSI BOMBYCINA, n.sp.

♀.—Length of antennæ.....	0.050 inch	...	1.27 millimètres.
Expanse of wings.....	0.085 × 0.045	...	2.14 × 1.13
Size of body.....	0.060 × 0.017	...	1.54 × 0.42

Antennæ nearly as long as the body; joints dusky brown, double, more than twice as long as broad, each half with moderately long verticillate hairs; joints twice as long as the pedicels, becoming gradually smaller towards the tip of the flagellum. Hypostoma and front pale ochraceous. Palpi slender, with a golden pubescence. Vertex ornamented with long golden hairs. Thorax deep brown, two very narrow pale longitudinal lines set with golden hairs, from the collar to the scutellum, mark the division of the usual broad stripes; humeri and scutellum ochraceous, the latter large, with erect hairs; pleuræ ochraceous-brown. Halteres whitish with a sparse pubescence, club elongate. Abdomen yellowish-red, sparingly clothed with yellowish hairs. Legs rather short and slender. Coxæ pale ochraceous. Femora pale ochraceous, with a dusky pubescence along the front, black at the tip. Tibiæ paler than the femora, dusky at the tip. First joint of the tarsi blackish; second joint pale; remaining joints blackish. Wings considerably rounded, pellucid, with a very pale bluish tint; very densely haired, the latter, in reflected light, appearing pale yellow, with bright violaceous markings. The latter first extending along the anterior side of the second longitudinal vein from the base to the tip, but not reaching the costa; another longitudinal patch between the second and third longitudinal veins, beginning directly in line with the tip of the first longitudinal vein, and extending to the

border of the wing below the apex ; a third patch is situated along the whole of the third longitudinal vein, enveloping its two branches but leaving a vacant triangular space of the yellow just under the arcuation of the posterior branch, and another between the fork ; this patch also appears to extend upwards to the base of the middle longitudinal band. (Description drawn from dried specimen).

*Hab.*—Sydney (Skuse).

Flagellar joints of the antennæ in the ♂ quite simple and with only one hair-whorl.

26. *DIPLOSIS VILLOSA*, sp.n.

♂.—Length of antennæ.....	0·060 inch	...	1·54 millimètres.
Expanse of wings.....	0·060 × 0·030	...	1·54 × 0·76
Size of body.....	0·050 × 0·010	...	1·27 × 0·25

Antennæ brownish-grey ; alternate joints just perceptibly larger than the intermediate ones ; terminal joint with a slender projecting process ; pedicels about as long as the joints ; verticils dense. Palpi pale yellowish. Thorax dull yellowish-brown, with two dense longitudinal rows of yellowish hairs running almost parallel from the collare to the scutellum ; pleuræ pale yellowish-brown. Halteres yellowish, pubescent ; club elongate, very little thicker than the stem. Abdomen light umbrous brown, thickly covered with yellowish pubescence. Legs rather short and slender. Coxæ yellow. Femora yellowish, with a light umbrous brown stripe along the upper side ; remaining joints light umbrous brown ; all with yellow articulations. Wings shorter than usual, and much rounded ; dark on account of their pubescence ; very densely clothed with greyish moderately long and somewhat interwoven hair ; pale bluish reflection. Veins of the same tint as the membrane of the wing. First longitudinal vein wide of the costal, running gradually into the margin about half way to the tip of the wing ; no apparent cross-vein ; second longitudinal vein prominent, very little bent posteriorly ; third longitudinal vein straight at first, then turning towards the posterior border

in an abrupt rounded angle ; anterior branch much arcuated from above the angle of the posterior branch. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters). January.

*Obs.*—I have only seen a single example of this well-marked species.

## 27. DIPLOSIS FACETA, sp.n.

♂.—Length of antennæ.....	0.050 inch	...	1.27 millimètres.
Expanse of wings.....	0.050 × 0.020	...	1.27 × 0.50
Size of body.....	0.030 × 0.006	...	0.76 × 0.15

Antennæ pale brownish-yellow ; joints all of the same size, subglobose ; terminal joint with a minute slender projection ; pedicels about one-half longer than the joints ; verticils somewhat sparse. Hypostoma and front pale yellowish-brown. Palpi very slender. Thorax sordid ochraceous-brown, nitidous, with a few rather long yellowish hairs ; pleuræ pale yellowish-brown ; scutellum large and prominent, yellowish-white. Halteres long, slender, with large pyriform club, yellowish-white, with a very fine pale pubescence. Abdomen sordid ochraceous-brown, with dusky or blackish markings on the first and second, and from the fourth to the eighth dorsal segments ; pale pubescence. Legs moderately long, very slender. Coxæ very pale. Femora pale, with a brownish-yellow pubescence at the tip. Tibiæ and tarsi densely covered with a brownish-yellow pubescence. Wings considerably flattened at the apex, very much narrowed towards the base ; hyaline ; sparsely haired, thicker at the apex ; moderately ciliated ; with a bright silvery reflection. Veins yellowish-brown. Second longitudinal little arcuated, reaching the margin at or immediately before the apex of the wing ; cross-vein short, not very oblique ; third longitudinal vein indistinct, turning abruptly towards the posterior border ; anterior branch not distinguishable on account of the wing fold. (Description drawn from dried specimen).

*Hab.*—Sydney (Skuse).

B. SECOND LONGITUDINAL VEIN REACHING THE MARGIN OF THE WING BEYOND THE APEX.

1. Hair-whorls of the flagellar joints in the ♂ equally long on the upper and under sides. (All ♀s with unspotted wings, the ♂s not being known, are located provisionally in this group).

a. *Wings unspotted.*

28. DIPLOSIS ADUSTA, sp.n

♂.—Length of antennæ.....	0.040 inch	...	1.01 millimètres.
Expanse of wings.....	0.100 × 0.045	..	2.54 × 1.13
Size of body.....	0.060 × 0.020	...	1.54 × 0.50

Antennæ dark brown almost black, sub-sessile, cylindrical; basal joints brown; terminal joint with a small projection; verticils pale brownish, rather dense. Hypostoma and front pale brownish; palpi yellowish-brown. Thorax smoky-brown, nitidous, two rows of hairs from the collare to the scutellum; scutellum yellowish-brown, with long erect hairs; pleuræ pale reddish-brown. Halteres blackish, pale at the base of the stalk and apex of the knob. Abdomen dark brown, paler underneath, with a bright yellowish pubescence; ovipositor short, pale brown. Coxæ pale yellowish-brown. Femora bright yellowish-brown, with a sparse covering of black scales and hairs, dense towards the tip. Tibiæ and tarsi black. Wings hyaline, with greyish pubescence, rather dense, especially towards the tip; splendid violaceous and purpureous reflections. The costal and two first longitudinal veins brown; cross-vein indistinct; third longitudinal pale. (Description drawn from dried specimen).

*Hab.*—Woronora (Masters and Skuse). October.

29. DIPLOSIS ARANEOSA, sp.n.

♂.—Length of antennæ.....	0.045 inch	...	1.13 millimètres.
Expanse of wings.....	0.100 × 0.040	...	2.54 × 1.01
Size of body.....	0.065 × 0.020	...	1.66 × 0.50

Antennæ greyish-brown ; joints cylindrical, twice the length of the pedicels ; verticils rather long and stiff ; basal joints pale ; end joint with a very small bud-shaped appendage. Labium and palpi pale yellowish-brown. Thorax dull greyish-brown, with two rows of erect greyish hairs arranged along two greyish stripes from the shoulders, but which do not coalesce posteriorly ; pleuræ greyish-yellow. Poisers pale and naked at the base, the stem and club brownish, thickly covered with deep brown scales or scaly hairs. Abdomen greyish-yellow, with the first two or three segments entirely of a dull, almost leaden grey ; long and dense brownish pubescence. Legs long and slender. Coxæ greyish-yellow ; the remaining joints greyish-brown with a light reflection. Wings pellucid, with a very pale bluish tint, densely clothed with yellowish somewhat bent hairs, posterior margin deeply ciliated at the angle, surface with rich golden and roseous reflections, the veins appearing violaceous. Veins greyish-brown ; costal well fringed ; transverse vein indistinct ; second longitudinal vein bent exteriorly, reaching the margin beyond the tip of the wing ; third longitudinal vein ill-defined, straight until it branches, turning towards the posterior border in an abrupt rounded angle. (Description drawn from dried specimen).

*Hab* —Elizabeth Bay (Skuse). October.

### 30. DIPLOSI OBSOLETA, sp.n.

♀.—Length of antennæ.....	0.055 inch	...	1.39 millimètres.
Expanse of wings.....	0.100 × 0.040	...	2.54 × 1.01
Size of body.....	0.060 × 0.020	...	1.54 × 0.50

Antennæ dirty yellowish-brown ; joints cylindrical, twice as long as the pedicels ; verticillate hairs yellowish, dense, moderately long ; end joint with a very small nipple-shaped process. Palpi long and slender, yellowish-brown. Thorax deep brown, with two rows of yellowish hairs from the humeri, meeting at the scutellum ; humeri pale brownish ; pleuræ deep brown ; scutellum pale brownish. Halteres pale brownish with a fine pubescence.

Abdomen deep brown, with a pale pubescence. Legs long and rather robust. Coxæ brown. Femora, tibiæ and tarsi sordid brown with paler articulations, appearing of a uniform pale fulvous when viewed in a certain direction; the femora with somewhat long, pale, semi-erect hairs. Wings pellucid, with a bluish tint, very densely haired, the posterior border not very deeply ciliated, reflection obscure on account of the dense pubescence, with a somewhat pruinose appearance. Venation pale brownish. Costal densely fringed, hairs diminishing in length from the base to the end of the first longitudinal; transverse vein very indistinct; second longitudinal vein thinner towards the end, reaching the border considerably beyond the apex of the wing; third longitudinal pale, particularly the anterior branch. (Description drawn from dried specimen).

*Hab.*—Glenbrook (Masters). January.

### 31. DIPLOSION MONTANA, sp.n.

♀.—Length of antennæ.....	0·040 inch	...	1·01 millimètres.
Expanse of wings.....	0·100 × 0·040	...	2·54 × 1·01
Size of body .....	0·065 × 0·020	...	1·66 × 0·50

Antennæ deep brown; joints long, sub-sessile, sub-cylindrical; verticils pale brownish; basal joints brown, the first considerably larger than the second; terminal joint with a small bud-shaped appendage. Hypostoma pale brown. Palpi rather long, pale brown. Thorax deep brown, levigate, sometimes with a greenish appearance; humeri reddish-brown; pale pubescence; pleuræ deep brown almost black. Halteres pale at the base, the stalk brown, knob pale. Abdomen brown, dorsal segments darker than the undersurface, densely covered with a pale pubescence. Legs very long and slender. Coxæ brown. Femora yellowish-brown at the base, the anterior half greyish-brown, appearing blackish when viewed at a certain obliquity. Wings pellucid, with a pale brown tint, thickly haired, the posterior margin densely but not very deeply ciliated; brilliant purpureous reflection. Veins pale brownish. Costal densely ciliated, hairs long at the base,



diminishing in length to the end of the first longitudinal vein ; cross-vein very oblique, distinct ; second longitudinal vein much thinner towards the end, joining the wing-margin immediately below the apex ; third longitudinal pale, anterior branch almost straight. (Description drawn from dried specimen).

*Hab.*—Glenbrook (Masters). January.

### 32. DIPLOSIS CONDIGNA, sp.n.

♂.—Length of antennæ..... 0·115 inch ... 2·91 millimètres.  
 Expanse of wings..... 0·100 × 0·035 ... 2·54 × 0·88  
 Size of body..... 0·050 × 0·015 ... 1·27 × 0·38

Antennæ greyish-brown ; alternate joints twice as large as the intermediate ones, double joints as long as the pedicels ; verticillate hairs moderately long and dense ; basal joints pale brown, second one very small ; terminal flagellar joint with a small bud-shaped appendage. Hypostoma and palpi yellowish-brown. Thorax smoky-brown, nitidous, with two rows of yellowish hairs from the collar, meeting at the scutellum ; pectus and plenræ pale brownish ; scutellum paler than the metathorax. Poisers yellowish at the base, stalk and club with a greyish pubescence. Abdomen sordid brown, thickly clothed with long yellowish hairs. Legs long and slender, greyish-brown, densely pubescent. Wings narrow, pellucid, appearing of a pale bluish tint ; densely covered with rather long bent hairs, somewhat tomentose towards the tip ; a brassy reflection with a greenish tinge ; a moderately long fringe on the posterior border. Veins yellowish-brown. Costal densely haired ; transverse vein distinct ; second longitudinal vein paler at the base, reaching the margin immediately beyond the apex of the wing ; third longitudinal vein pale but perfectly distinguishable. (Description drawn from dried specimens).

*Hab.*—Elizabeth Bay (Masters and Skuse). Beginning of December.

### 33. DIPLOSIS FALLAX, sp.n.

♀.—Length of antennæ..... 0·040 inch ... 1·01 millimètres  
 Expanse of wings..... 0·090 × 0·040 ... 2·27 × 1·01  
 Size of body..... 0·070 × 0·020 ... 1·77 × 0·50

Antennæ greyish-brown; joints sub-sessile, cylindrical; pedicels paler; verticils long, sparse; basal joints large, pale yellowish-brown; terminal joint with a small nipple-shaped projection. Hypostoma and front pale yellowish-brown. Thorax smoky, yellowish, two rows of bright yellowish hairs; scutellum fulvous; pleuræ sordid yellow; collare yellowish-brown. Halteres blackish, pale at the base of the stalk. Abdomen pale brown, reddish posteriorly, with an obscure greyish patch on the first two or three dorsal segments; ovipositor short, yellow, with two small oval lamellæ. Legs cinereous with a lighter reflection. Wings pellucid, with a pale bluish tint, thickly haired, and having a brassy reflection. The costal and three longitudinal veins yellowish; cross-vein indistinct before joining the first longitudinal vein; third longitudinal very indistinct. (Description drawn from dried specimen).

*Hab.*—Woronora (Masters and Skuse).

### 34. DIPLOSION SULFUREA, sp.n.

♀.—Length of antennæ.....	0·033 inch	...	0·83 millimètre.
Expanse of wings.....	0·090 × 0·040	...	2·27 × 1·01
Size of body....	0·060 × 0·018	...	1·54 × 0·45

Antennæ faded brown; basal joints yellowish; joints of the flagellum stout, sessile, cylindrical, verticillate-pilose, the last joint with a very small cylindrical projection. Head yellow with some pale hairs. Hypostoma and front sordid grey; palpi slender. Thorax pale yellow, with two rows of somewhat long yellowish hairs. Halteres yellow at the base, upper portion with club reddish-brown, haired. Abdomen pale yellow, with a long pale yellowish pubescence. Legs rather long. Coxæ yellowish. Femora, tibiæ, and tarsi yellowish, with a dense pubescence, and a pale reflection. Wings pellucid, of a pale yellowish tint, and having a very close pubescence; brassy reflection slightly tinged with violet; fringe dense, moderately long. Veins pale yellowish-brown. Costal vein strong; cross-vein fairly distinct, rather oblique; second longitudinal vein paler than the first, reaching the

wing-margin beyond the tip ; third longitudinal vein paler than the second, straight until it forks, posterior branch somewhat sinuous. (Description drawn from fresh specimen).

*Hab.*—Sydney (Masters and Skuse).

### 35. DIPLOSIS PARILIS, sp.n.

♀.—Length of antennæ.....	0·035 inch	...	0·88 millimètre.
Expanse of wings .....	0·090 × 0·035	...	2·27 × 0·88
Size of body .....	0·040 × 0·017	...	1·01 × 0·42

Antennæ sordid yellowish-brown ; joints cylindrical, sub-sessile, about six times as long as the pedicels, verticillate-pilose ; basal joints pale brown ; no terminal process visible. Hypostoma pale brownish. Palpi long, slender, pale brownish. Thorax pale reddish-brown, levigate, with a pale pubescence ; humeri dull yellowish ; pleuræ sordid yellowish-grey ; scutellum pale brownish. Halteres sordid yellow at the base, stem and club greyish-yellow, with a blackish pubescence. Abdomen yellowish-grey, dorsal segments darker, densely covered with a yellowish pubescence. Legs long and slender. Coxæ yellowish-grey. Femora, tibiæ, and tarsi griseous. Femora pale, having a pale yellow appearance at the base. Wings pellucid, with a pale yellowish tint ; thickly haired ; golden and roseous reflections. Veins pale brown. Costal densely fringed, with some long semi-erect hairs before the junction with the first longitudinal ; cross-vein very oblique and indistinct ; second longitudinal vein somewhat indistinct at the base, thickened at the transverse vein and much thinner towards the end, reaching the margin immediately beyond the apex of the wing ; third longitudinal pale and indistinct, particularly the anterior branch ; posterior branch turning towards the border at a very abrupt and pointed angle. (Description drawn from dried specimen).

*Hab.*—Middle Harbour (Skuse).

### 36. DIPLOSIS BELLULA sp.n

♂.—Length of antennæ.....	0·080 inch	...	2·02 millimètres.
Expanse of wings.....	0·090 × 0·030	...	2·27 × 0·76
Size of body.....	0·045 × 0·020	...	1·13 × 0·50

Antennæ greyish-brown ; alternate joints very little larger than the intermediate ones, sub-globular, somewhat pyriform ; pedicels longer than the joints ; verticillate hairs greyish ; terminal joint with a long cylindrical process. Thorax with three very broad reddish-brown stripes almost coalescing anteriorly, the intermediate one reaching only to the middle, the lateral ones to the hinder margin ; the space between the three stripes very narrow, yellowish-brown, but there is a considerable surface of the yellowish-brown interval visible behind the limit of the middle stripe ; a few rather long pale hairs ; collare pale ; pleuræ and scutellum pale greyish-brown. Halteres with a blackish pubescence, the base of stem and tip of club naked. Abdomen light umber brown, somewhat darker superiorly, and densely clothed with a yellowish pubescence. Coxæ pale greyish-brown. Femora with a broad longitudinal stripe of dark pubescence above, a short yellowish pubescence and some very long stiff hairs underneath. The remaining joints cinereous, in some directions with a light reflection. Wings with a greyish pubescence, moderately long fringe on the costal and posterior margins, and a rich golden reflection, violaceous along the venation. Veins pale brown ; two first longitudinal veins well-defined, the second longitudinal vein reaching the wing-margin beyond the apex ; cross-vein indistinct ; third longitudinal also faint. (Description drawn from dried specimen).

*Hab.*—Peat's Ferry (Masters and Skuse).

### 37. DIPLOIS SENILIS, sp.n.

♀.—Length of antennæ.....	0.030 inch	...	0.76 millimètre.
Expanse of wings.....	0.090 × 0.030	...	2.27 × 0.76
Size of body.....	0.045 × 0.015	...	1.13 × 0.38

Antennæ greyish-brown ; joints long, sub-sessile, cylindrical ; verticillate hairs long and rather light ; end joint with a small short process ; basal joints greyish-yellow, sub-globular. Hypostoma and front pale greyish-yellow. Thorax brown, levigate, with rather long yellowish hairs ; collare, pleuræ, and scutellum pale. Poisers pale, with a

sparse blackish pubescence. Abdomen pale, with a brownish tint, darker anteriorly, particularly superiorly on the first two or three segments, covered thickly with long pale shining hairs. Legs griseous, the coxæ and femora with a yellowish appearance. Wings pellucid, almost hyaline, with a very pale yellowish tint, well haired, more thickly towards the tip, purpureous and golden reflections, margined with a pale pubescence. Costal yellowish brown, some long pale hairs before the end of the first longitudinal vein; cross-vein pale and indistinct, very oblique; second longitudinal vein moderately curved, joining the wing-margin a short distance beyond the apex; third longitudinal pale and indistinct. (Description drawn from dried specimen).

*Hab.*—Coogee Bay, near Sydney (Skuse). In September.

### 38. DIPLOSIS RUSTICULA, sp.n.

♂.—Length of antennæ..... 0·070 inch ... 1·77 millimètres.

Expanse of wings.... 0 085 × 0·040 ... 2·14 × 1·01

Size of body..... 0·045 × 0·015 ... 1·13 × 0·38

Antennæ brownish; alternate flagellar joints a little longer than the intermediate ones; pedicels of the double joints as long as a simple joint; verticils greyish, moderately long; terminal flagellar joint with a small excrescence; basal joints sordid brown. Thorax faded brown, levigate, with some short pale hairs; pleuræ and scutellum sordid yellowish-grey. Halteres sordid yellow-grey at the base, the club whitish, with a black pubescence. Abdomen sordid brown, darker than the thorax, first segments almost black superiorly, covered with a somewhat long pale pubescence. Legs long. Coxæ yellowish-grey. Femora very pale yellowish, with a sparse blackish pubescence. Tibiæ and tarsi very pale yellowish, almost whitish, with a short pubescence. Wings pellucid, with a very pale brownish-yellow tint; closely haired on the surface, and having a pale roseous reflection. Veins yellowish-brown. Second longitudinal vein reaching the margin below the tip; third longitudinal indistinct, particularly the anterior branch. (Description drawn from dried specimen).

*Hab.*—Como (Skuse).

39. *DIPLOSIS FURVA*, sp.n.

♀.—Length of antennæ.....	0·030 inch	...	0·76 millimètre.
Expanse of wings.....	0·085 × 0·040	...	2·14 × 1·01
Size of body.....	0·050 × 0·017	...	1·27 × 0·42

Antennæ dark brown or black; joints thick, cylindrical; pedicels very short; basal joints brown; terminal joint with a narrow projection, more than half the length of the joint, verticillate-pilose. Hypostoma and front pale brownish; palpi long, slender. Thorax light brown, nitidous, with two rows of long erect hairs; pleuræ sordid brown; scutellum light brown, with long erect hairs. Poisers pale at the base, stalk and club thickly covered with brown scales and hair. Abdomen umber brown, with a dense long pubescence. Legs very long and slender, cinereous, almost black on account of their pubescence, the coxæ somewhat sordid brownish. Wings appearing almost blackish, densely clothed with moderately long slightly bent hairs, the posterior margin deeply ciliated, the fringe on the posterior angle much longer than the rest; bright brassy reflection. Costal covered with rather long hairs; cross-vein not very oblique, distinct; second longitudinal vein very little bent; third longitudinal vein pale, particularly the anterior branch. (Description drawn from dried specimen).

*Hab.*—Middle Harbour (Skuse).

40. *DIPLOSIS QUÆSITA*, sp.n.

♀.—Length of antennæ.....	0·025 inch	...	0·62 millimètre.
Expanse of wings.....	0·080 × 0·030	...	2·02 × 0·76
Size of body .....	0·045 × 0·015	...	1·13 × 0·38

Antennæ greyish-brown; joints sub-sessile, cylindrical, thick, verticillate-pilose; pedicels very short, scarcely visible, paler than the joints; terminal joint with a small nipple-shaped process. Labium and palpi yellowish-brown, the latter slender. Thorax reddish-brown, levigate, the usual two rows of hairs along narrow stripes of a paler brown, almost meeting posteriorly; collare and



scutellum yellowish-brown. Halteres blackish in the middle, yellowish at the base of the stalk, and club whitish. Abdomen reddish-brown, with a pale yellowish pilosity. Coxæ yellowish-brown. Femora very pale yellowish-brown with a black pubescence. Tibiæ and tarsi griseous. Wings pellucid, with a very pale bluish tint, a rather close pubescence, and a rich golden reflection. Veins greyish-yellow. Costal with long hairs before the tip of the first longitudinal vein, and thickly covered with a shorter pubescence throughout its length; cross-vein rather oblique, pale; second longitudinal reaching the margin of the wing a little beyond its tip; third longitudinal rather indistinct, anterior branch very little curved. (Description drawn from dried specimen).

*Hab.*—Woronora (Masters and Skuse).

#### 41. DIPLOSIS CONSPECTA, n.sp.

♀.—Length of antennæ.....	0·050 inch	...	1·27 millimètres.
Expanse of wings.....	0·070 × 0·030	...	1·77 × 0·76
Size of body.....	0·070 × 0·010	...	1·77 × 0·25

Antennæ almost cinereous; joints large, cylindrical, separated by pedicels more than half the length of the joints; verticils greyish, moderately dense. Hypostoma and front pale reddish-brown; palpi pale yellowish-brown. Thorax deep brown, with two longitudinal rows of yellow semi-erect hairs meeting in a point at the scutellum; humeri reddish-yellow; scutellum and pleuræ light brown. Halteres slender, club pale brown, elongate, the stalk yellow. Abdomen red, terminal joints and ovipositor yellowish; pale yellowish pubescence. Legs rather short and robust, cinereous, the coxæ paler, and having pale articulations. Wings pellucid, with a pale bluish tint, somewhat ferruginous at their insertion, densely haired, particularly towards the tip, iridescent, with roseous and golden reflections; deeply ciliated on the anterior border for a short distance past the termination of the first longitudinal vein, at the tip, and on the posterior angle. Veins yellowish-grey. Transverse vein distinct, not very oblique; second

longitudinal vein joining the margin below the apex of the wing ; third longitudinal vein very indistinct. (Description drawn from dried specimen).

*Hab.*—Richmond, Hawkesbury district (Skuse). January.

#### 42. DIPLOSIS MOLLIPES sp.n.

♂.—Length of antennæ.....	0·065 inch	...	1·66 millimètres.
Expansé of wings.....	0·070 × 0·030	...	1·77 × 0·76
Size of body.....	0·040 × 0·010	..	1·01 × 0·25
♀.—Length of antennæ.....	0·035 inch	..	0·88 millimètre.
Expansé of wings.....	0·070 × 0·030	...	1·77 × 0·76
Size of body.....	0·050 × 0·015	...	1·27 × 0·38

Antennæ greyish; joints darker than the pedicels; ♂ alternate joints double; verticils greyish, moderately long; terminal joint with a small projection: ♀ joints cylindrical, twice as long as the pedicels, last joint ending in a small bud-shaped appendage; basal joints pale, almost white. Hypostoma and front pale yellow; palpi yellow. Thorax pale yellow, tinged with a light reddish-brown in the ♀, with two rows of long yellowish hairs; pleuræ, collare, scutellum, and halteres pale yellow, with a pale yellow pubescence. Abdomen paler yellow than the thorax, particularly of the ♀, densely covered with fine pubescence of the same colour. Legs very pale yellow, the fore and middle femora with a short, somewhat sparse, blackish pubescence on the upper side. Wings pellucid, with a very pale but somewhat impure bluish tint, rather close pubescence, and having a pale brassy reflection. Veins yellowish. Cross-vein pale, not very oblique; second longitudinal vein joining the margin beyond the tip of the wing; third longitudinal nearly straight from the base to the end of the anterior branch, posterior branch only slightly bent. (Description drawn from dried specimens).

*Hab.*—Sydney (Masters and Skuse).

*Obs.*—A large ♀ taken by Mr. Masters on 19th December, at Elizabeth Bay, has the last two joints of the tarsi blackish.

43. *DIPLOSIS GILVA*, sp.n.

♂.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expanse of wings.....	0·060 × 0·020	...	1·54 × 0·50
Size of body.....	0·050 × 0·010	...	1·27 × 0·25

Antennæ longer than the wings, whitish ; alternate joints twice the size of the intermediate ones ; terminal joint with a small process ; verticils short, dense ; pedicels rather longer than the double joints ; basal joints pale yellow. Hypostoma and front pale yellow. Palpi short, slender, pale yellow, Thorax pale brownish-yellow, with a yellowish pubescence : pleuræ pale brownish-yellow ; scutellum large, prominent, pale brownish-yellow. Halteres pale yellow, pubescent ; stem very slender, club elliptical. Abdomen very pale yellow, with pale yellow hair, forceps tinged with brown. Legs short, slender, pale yellow, pubescent, with a silvery reflection. Wings pellucid, with a pale yellowish tint, densely covered with a pale yellow pubescence, particularly towards the tip ; pale silvery reflection. Veins yellow. Second longitudinal vein arcuating considerably exteriorly, reaching the margin a short distance beyond the apex of the wing ; cross-vein very indistinct ; third longitudinal vein very indistinct, turning abruptly towards the posterior margin, anterior branch invisible. (Description drawn from dried specimen).

*Hab* —Gosford (Skuse).

*Obs.*—Very like *D. mollipes*, but differing from it in the shortness of the legs, antennæ, &c.

44. *DIPLOSIS DISCEDENS*, sp.n.

♀.—Length of antennæ.....	0·015 inch	...	0·38 millimètre.
Expanse of wings.....	0·090 × 0·040	...	2·27 × 1·01
Size of body.....	0·055 × 0·010	...	1·39 × 0·25

Antennæ very short, ochraceous-brown ; joints sessile, cylindrical, about twice as long as broad, with short, fine, yellowish verticils. Eyes considerably separated. Hypostoma and front

pale ochraceous. Palpi short, slender, ochraceous-brown, Thorax pale yellow, nitidous, with a golden pubescence; scutellum paler yellow, considerably rounded anteriorly, slightly pubescent; pleuræ pale ochraceous. Halteres large, the stem very slender, ochraceous-brown, pale at the base; club elongate, pyriform, ochraceous-brown. Abdomen pale yellow, with an ill-defined, roundish, dusky spot on the second or third dorsal segment, densely clothed with a short yellowish pubescence. Legs long, slender, densely haired. Coxæ ochraceous-brown. Femora ochraceous, ochraceous-brown on the front and at the tip. Tibiæ and tarsi ochraceous-brown, with a somewhat golden reflection when viewed at a certain obliquity. Wings hyaline, very densely and uniformly haired, moderately ciliated, with roseous and golden reflections. Veins pale brown. First longitudinal vein pale, joining the costal at about a third of the distance from the apex of the wing; second longitudinal vein pale and slightly sinuose before the cross-vein, running very near the first longitudinal at the cross-vein, then arcuating exteriorly, meeting the margin just beyond the apex of the wing; third longitudinal fairly distinct, turning abruptly towards the posterior margin; anterior branch at first bending upwards for a very short distance, then running almost direct to the border. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters).

#### 45. DIPLOSIS ERRONEA, sp.n.

♀.—Length of antennæ.....	0·025 inch	...	0·62 millimètre.
Expanse of wings.....	0·06 × 00·020	...	1·54 × 0·50
Size of body.....	0·040 × 0·015	...	1·01 × 0·38

Antennæ greyish-brown; joints sub-sessile, cylindrical, verticillate-pilose; basal joints yellowish; terminal joint with a small projection. Hypostoma and front yellowish; palpi slender. Thorax yellowish-brown, somewhat shining, with a few rather long erect hairs; scutellum yellowish-brown; pleuræ pale yellowish-brown. Abdomen yellowish-brown, paler between the segments, with a

pale pubescence. Halteres yellowish at the base and tip of knob, middle portion covered with black scales. Legs cinereous, femora paler. Wings pellucid, with a pale bluish tint, yellowish pubescence, and a brilliant brassy reflection. Costal and first and second longitudinal veins pale brownish; first longitudinal vein very close to the costa; cross-vein long, indistinct; third longitudinal vein very indistinct. (Description drawn from fresh specimen).

*Hab.*—Sydney (Skuse). End of November.

#### 46. DIPLOSIS HUMILIS, sp.n.

♂.—Length of antennæ.....	0.050 inch	...	1.27 millimètres
Expanse of wings.....	0.050 × 0.020	...	1.27 × 0.50
Size of body.....	0.035 × 0.008	...	0.88 × 0.20
♀.—Length of antennæ.....	0.044 inch	...	1.10 millimètres.
Expanse of wings.....	0.065 × 0.025	...	1.66 × 0.62
Size of body.....	0.040 × 0.017	...	1.01 × 0.42

♂.—Antennæ greyish-brown; alternate joints almost double the size of the intermediate ones; pedicels rather short; basal joints yellow; terminal joint with a slender projection. Front and mouth yellowish. Thorax pale brownish-yellow, nitidous, with a pale pubescence; pectus brownish; collare yellowish. Halteres yellowish, the stem long and slender, and the club almost globose. Abdomen pale yellow, with pale hairs, more dense and with a silvery reflection laterally, a dark patch on the first two or three dorsal segments, forceps yellow. Legs short and slender, pale yellow, femora slightly blackish on the upper side towards the tip. Wings pellucid, with a very pale purplish-brown tint, densely covered with a somewhat bent pubescence, and having a silvery reflection. Veins pale yellow. Transverse vein rather long, moderately oblique, indistinct; second longitudinal vein considerably bent posteriorly, reaching the margin below the apex of the wing; third longitudinal vein straight, turning towards the posterior border in an obtuse, scarcely rounded, angle.



♀.—Joints of antennæ deep brown, thick, cylindrical, on pedicels which are more than half the length of the joints; basal joints brownish-yellow. Hypostoma and front reddish-yellow; palpi reddish-yellow. Thorax pale reddish-yellow, with a pale pubescence; pectus reddish-yellow; collare yellowish. Halteres as in ♂. Abdomen reddish-yellow, densely clothed with short shining hairs, the first two or three dorsal segments with a blackish patch; ovipositor short, yellow. Legs rather longer and more robust than in ♂, the femora not so distinctly blackish as in ♂. Wings larger than those of the ♂, similar in other respects, except that the reflection is pale brassy. (Description drawn from dried specimens).

*Hab.*—Wheeny Creek, Hawkesbury district (Skuse). January.

*Obs.*—I found this in great profusion flying about the short grass exposed to the hottest sunshine, a striking contrast to the shade-loving propensities of most of the members of the family.

#### 47. DIPLOSIIS SCELESTA, sp.n.

♂.—Length of antennæ .....	0·040 inch	...	1·01 millimètres.
Expanse of wings.....	0·040 × 0·020	...	1·01 × 0·50
Size of body.....	0·030 × 0·008	...	0·76 × 0·20

Antennæ ochraceous-brown; alternate joints of the flagellum only a little larger than the intermediate ones, globose towards the termination, the joints and pedicels only half the size of those at the base; basal joints almost twice the size of the neighbouring flagellar joints; pedicels shorter than the joints. Hypostoma and front pale ochraceous. Palpi slender. Thorax yellowish-brown, nitidous, with some pale hairs; pleuræ red-ochraceous, scutellum prominent, yellowish. Halteres ochraceous, sparsely haired, club large, ovate, almost globose. Abdomen red-ochraceous, densely clothed with a fine pale pubescence; forceps large, pale brown. Legs moderately long, slender. Coxæ pale reddish-ochraceous; remaining joints greyish-yellow, densely pubescent. Wings hyaline, rather short, somewhat rounded, thickly haired and having a deeply ciliated margin; pale argenteous reflection



when viewed at a certain obliquity. Veins slightly yellowish. Costal and two first longitudinal veins thick; second longitudinal vein gently arcuated exteriorly, meeting the costal immediately beyond the apex of the wing; third longitudinal particularly pale and indistinct, anterior branch altogether wanting. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Skuse). January.

b. *Wings variegated.*

48. DIPLOSION MACLEAYI, sp.n.

♀.—Length of antennæ.....	0.060 inch	...	1.54 millimètres.
Expanse of wings.....	0.090 × 0.050	...	2.27 × 1.27
Size of body.....	0.070 × 0.020	...	1.77 × 0.50

Antennæ nearly as long as the body; joints sordid grey, on yellowish-white pedicels half the length of the joints; verticils yellowish-white. Head dingy brown, with long yellowish hairs on the vertex; front pale. Palpi sordid grey. Thorax with three brown longitudinal stripes, the intermediate one pale, cuneiform; the lateral ones not so long, indistinctly elliptical; long-yellowish hairs; pleuræ pale brown. Halteres clothed with black hairs, the root of the stalk and tip of the knob naked, whitish. Abdomen deep reddish-brown, without bands, with yellowish hairs. Legs rather long, slender. Coxæ yellowish-brown. Femora sordid grey, the tips yellow. Anterior tibiæ golden-yellow, middle and hind ones black, the base with a slight ring of yellow. All the tarsi black on the first, short joint; the second joint golden-yellow with a broad ring of black near the base and at the tip; third and fourth joints hoary when viewed in a certain light, tipped with a ring of black. Wings pale yellowish, appearing of splendid colours when viewed in an oblique direction, with mottlings of a violet reflection. These violet markings prevail to such an extent as to leave only very little of the pale yellowish visible. A band commencing on the margin at about two-thirds of the distance from the base to the tip of the wing, running almost vertically downwards to the

first longitudinal vein, incurved from that to the second longitudinal vein, and descending again almost vertically to the margin about mid-way between the branches of the third longitudinal vein; a spot at the base of the wing enclosed by the transverse and the first and second longitudinal veins; a second small longitudinal spot over the junction of the first longitudinal with the costal border; a fourth appearance having the form of a narrow, irregular arcuation starting from the base behind the posterior branch of the third longitudinal vein, extending over the base of the anterior branch, and joining the margin again a short distance in front of the posterior branch; and lastly another spot occurs at the tip of the wing over the junction of the second longitudinal vein with the margin, indeterminate, somewhat extended posteriorly. Fringe of the wings pale yellowish, but blackish where the violet markings reach the wing-margin. (Description drawn from dried specimen).

*Hab.*—Woronora (Masters and Skuse). October; in caves.

#### 49. DIPLOSIS DIBAPHA, sp.n.

♀.—Length of antennæ.....	0·040 inch	..	1·01 millimètres.
Expanse of wings.....	0·070 × 0·030	...	1·77 × 0·76
Size of body.....	0·050 × 0·010	...	1·27 × 0·25

Antennæ cinereous; basal joints large, yellowish; joints of the flagellum sub-cylindrical, more than twice as long as broad, verticillate-pilose, four times as long as the pedicels; terminal joints with a slender projection. Vertex with long golden hairs. Palpi slender, yellowish. Thorax dull castaneous, two longitudinal rows of golden hairs from the humeri to the scutellum, dense, spreading over the middle cuneiform portion; also some golden hairs in front of the base of the wings; pleuræ pale brown; scutellum dull castaneous, with golden hairs. Poisers large, with a minute golden pubescence, slightly blackish just beneath the club, the latter pyriform. Abdomen uniformly dull castaneous, terminal joints with a yellowish tinge, densely clothed with yellowish or golden hairs; ovipositor as long as the abdomen,

yellow. Legs moderately long and slender, covered with a rich golden pubescence, the upper side of the femora, and the tarsal joints more or less tinged with blackish. Wings pellucid, with a very pale bluish tint, densely pubescent, in an oblique direction appearing almost golden-yellow with bright violaceous spots. One longitudinal spot on the costal border, extending over the anterior half of the first longitudinal vein, another below the second longitudinal vein rather in advance of the first spot. The whole apical portion of the wing enveloped in a more or less nebulous marking, a small spot of the yellow being distinctly visible at the tip of the second longitudinal; this colour runs also in a narrow band up the anterior branch of the third longitudinal vein, and widens as it extends down the posterior branch to the margin of the wing, forming an irregular arcuation; in the middle of the anterior branch a short band extends upwards, not so far as, and immediately anterior to, the second named spot. Another ill-defined marking exists on the margin just before the base of the third longitudinal vein. Veins yellow. Second longitudinal vein thick, reaching the margin immediately beyond the apex of the wing; third longitudinal not very distinct. (Description drawn from dried specimen).

*Hab.*—Illawarra district (Masters and Skuse); Coogee Bay (Skuse). September.

#### 50. DIPLOSIS FREQUENS, sp.n.

♂.—Length of antennæ....	0.050 inch	...	1.27 millimètres.
Expanse of wings .....	0.055 × 0.025	...	1.39 × 0.62
Size of body.....	0.045 × 0.008	...	1.13 × 0.20
♀.—Length of antennæ.....	0.020 inch	...	0.50 millimètre.
Expanse of wings.....	0.060 × 0.025	...	1.54 × 0.62
Size of body.....	0.050 × 0.010	...	1.27 × 0.25

♂ and ♀. Antennæ pale brown; ♂ joints sub-globose, alternate joints almost imperceptibly larger than the intermediate ones, rather shorter than the pedicels; short dense verticils; terminal joint with a slender projection: ♀ joints sub-cylindrical, rather

longer than broad, with very short pedicels, verticillate-pilose; terminal joint with a small projection. Vertex with golden hairs. Hypostoma and front pale yellowish. Palpi very slender, yellowish. Thorax ochraceous-brown, rather paler in the ♀, with two rows of long golden hairs; pleuræ pale ochraceous-brown. Halteres yellow, the club large, elongate. Abdomen pale ochraceous, banded with cinereous; dense golden pubescence; ♂ forceps and ♀ ovipositor yellow. Legs moderately long and slender. Coxæ pale ochraceous. Femora pale ochraceous, with a short golden pubescence, and cinereous on the upper side, the latter more distinct in the ♂. Remaining joints cinereous, with pale ochraceous reflections. Articulations golden. Wings considerably more rounded in the ♂ than the ♀, pellucid, very densely haired and ciliated with golden-yellow hairs; reflecting violaceous markings when viewed at a certain obliquity. These spots are very distinct in the ♀ but faint and ill-defined in the ♂, and correspond with those on the wing of *D. dibapha*, except that the nebulous marking on the apical portion is rather more detached, and the spot immediately below the second longitudinal vein is very indistinct in this species. Second longitudinal vein very little arcuated, reaching the border just beyond the apex of the wing; cross-vein most indistinct; third longitudinal vein turning abruptly towards the posterior border; anterior branch considerably arcuated, indistinct. (Description drawn from dried specimens).

*Hab.*—Elizabeth Bay (Masters and Skuse). End of December.

#### 51 DIPLOSIS CERTA, sp.n.

♀.—Length of antennæ.....	0·025 inch	...	0·62 millimètre.
Expanse of wings .....	0·070 × 0·030	...	1·77 × 0·76
Size of body.....	0·050 × 0·010	...	1·27 × 0·25

Antennæ brown, joints sub-cylindrical, sessile, verticillate-pilose. Hypostoma and front pale ochraceous. Palpi very slender, pale ochraceous. Thorax ferruginous-brown, nitidous, with two longitudinal rows of yellowish hairs; humeri and posterior corners

ochraceous; pleuræ deep brown; scutellum ferruginous-brown. Halteres moderately long, stem yellow; club brown, almost pyriform. Abdomen light reddish-brown, with a dark patch on the first three dorsal segments; terminal joint also dark; yellowish pubescence. Legs moderately long, slender, cinereous, articulations pale. Wings pellucid, with a very pale yellowish tint; moderately haired, more dense towards the tip; a rich golden reflection variegated with ill-defined spots of pale yellow or whitish hairs. Three longitudinal almost equidistant spots on the costal vein; a spot just below the third costal, and one at the end of the second longitudinal vein immediately beyond the tip of the wing, a sixth spot below the second longitudinal vein slightly anterior to the second costal spot, a seventh mid-way between the last and the apical spot, and three almost equidistant spots (the last a short distance from the posterior border), along the anterior side of the third longitudinal vein; the last is an irregular arcuation from the posterior margin, up the posterior branch of the third longitudinal vein, extending about half way down the anterior branch, and falling vertically again to the margin. Second longitudinal running rather close to the costa, joining the margin beyond the apex of the wing; cross-vein rather oblique, indistinct; third longitudinal vein indistinct, turning abruptly to the posterior margin; anterior branch most indistinct. (Description drawn from dried specimen).

*Hab.*—Woronora (Masters and Skuse).

2. Antennæ in the ♂ decorated with long hairs on the upper side.

## 52. DIPLOSIS VIOLACEA, sp.n.

♂.—Length of antennæ.....	0.110 inch	...	2.79 millimètres.
Expanse of wings.....	0.110 × 0.040	...	2.79 × 1.01
Size of body.....	0.080 × 0.020	...	2.02 × 0.50
♀.—Length of antennæ.....	0.045 inch	...	1.13 millimètres.
Expanse of wings.....	0.140 × 0.050	...	3.55 × 1.27
Size of body.....	0.110 × 0.030	...	2.79 × 0.76



♂ and ♀.—Joints of the flagellum black; pedicels sordid grey; verticils greyish; ♂ with long hair on the upper side; basal joints large, pale brownish; double joints very large, almost pyriform; simple joints as long as the pedicels at the base of the flagellum, pedicels increasing in length, and joints decreasing in size towards the extremity; last joint with a long slender projection: ♀ sub-sessile, sub-cylindrical, three times as long as the pedicels; terminal joint with a small conical process. Front yellowish-brown. Thorax pale brown, nitidous, with long hairs, two rows from the collare to the scutellum; scutellum prominent, sordid brown, with a row of erect hairs. Halteres blackish, pale at the base of the stalk. Abdomen sordid brown, darker superiorly on the first two or three segments. Legs extremely long, slender. Coxæ pale. Femora, tibia, and tarsi blackish, the last joints with a greyish reflection. Wings appearing blackish on account of their dense pubescence, with a beautiful violet reflection, the latter not quite so apparent in the ♂. The costal and the two first longitudinal veins brown; cross-vein rather indistinct; the third longitudinal pale but distinct, anterior branch nearly straight. (Description drawn from dried specimens).

*Hab.*—Sydney, Woronora, Middle Harbour, and Blue Mountains (Masters and Skuse).

*Obs.*—This species may frequently be seen, like many of its congeners, in great numbers in caves, hanging upon the long threads of spiders' webs.

### 53. DIPLOSIS SAXATILIS, sp.n

♂.—Length of antennæ.....	0.120 inch	...	3.04 millimètres.
Expanse of wings.....	0.110 × 0.040	...	2.79 × 1.01
Size of body.....	0.080 × 0.018	...	2.02 × 0.45
♀.—Length of antennæ.....	0.040 inch	...	1.01 millimètres.
Expanse of wings .....	0.090 × 0.034	...	2.27 × 0.86
Size of body.....	0.075 × 0.020	...	1.89 × 0.50



♂ and ♀.—Antennæ sordid grey; joints darker than the pedicels; basal joints yellowish; verticils moderately long, dense; ♂ pedicels twice as long as the joints; alternate joints larger, two long hairs on each joint on the upper side; terminal joint with a process like half a pedicel; ♀ sub-sessile, sub-cylindrical, more than twice as long as the pedicels: end joint with a small projection. Front pale. Thorax and abdomen greyish or greyish-brown, darker above, with a pale pubescence (♀ abdomen sometimes with a reddish tinge). Halteres blackish, pale at the base and tip of knob. Legs of the ♂ longer than those of ♀, sordid grey, with the tip of the third, and the last two joints of the tarsi hoary. Wings pellucid, with a dense yellowish pubescence and a brassy reflection. Costal border blackish. First longitudinal vein close to the costa, but quite distinct; second longitudinal vein yellowish-brown; transverse vein indistinct; branches of the third longitudinal indistinct. (Description drawn from dried specimens).

*Hab.*—Elizabeth Bay, Sydney (Masters and Skuse).

#### 54. DIPLOPSIS CONTIGUA, sp.n.

♂.—Length of antennæ.....	0·100 inch	...	2·54 millimètres.
Expanse of wings.....	0·090 × 0·030	...	2·27 × 0·76
Size of body.....	0·060 × 0·015	...	1·54 × 0·38

Antennæ sordid ochraceous; alternate joints globose and sub-globose or almost ovate, all about the same size; verticils moderately long, dense; stiff hairs on the upper side twice the length of the verticils; pedicels one half longer than a joint; terminal joint with a slender projection. Hypostoma and front sordid ochraceous. Palpi long and slender, pale brown. Thorax smoky ochraceous-brown, nitidous, with the usual two longitudinal rows of hairs separating three darker bands; pleuræ ochraceous-brown; scutellum prominent, ochraceous. Halteres ochraceous at the base, the stalk and club pubescent, cinereous; club large, somewhat elongate. Abdomen ochraceous-brown, the

dorsal segments darker, inclining to umber; clothed with a pale pubescence. Legs long, slender, densely pubescent, almost cinereous; coxæ and femora somewhat ochraceous. Wings densely haired, pellucid, with the faintest bluish tint; brassy reflection. Veins yellowish. Cross-vein very oblique, distinct; third longitudinal indistinct, anterior branch barely distinguishable. (Description drawn from dried specimen).

*Hab.*—Wheeny Creek, Hawkesbury district (Skuse). January.

*Obs.*—Closely allied to the preceding.

# 55. DIPLOSIS NEGOTIOSA, sp.n.

♂.—Length of antennæ.....	0·100 inch	...	2·54 millimètres.
Expanse of wings.....	0·090 × 0·035	...	2·27 × 0·88
Size of body.....	0·070 × 0·010	...	1·77 × 0·25
♀.—Length of antennæ.....	0·035 inch	...	0·88 millimètre.
Expanse of wings.....	0·110 × 0·040	...	2·79 × 1·01
Size of body.....	0·060 × 0·020	...	1·54 × 0·50

Antennæ in the ♂ longer than the wings, pale brown; joints sub-globose, alternate joints rather larger; the characteristic long hairs shorter in the larger joints; becoming considerably smaller towards the tip of the flagellum; pedicels rather longer than the joints; ♀ darker brown; cylindrical, sub-sessile; terminal joint with a short narrow projection; verticillate-pilose. Hypostoma and front pale brown. Palpi slender, very pale brown. Thorax in the ♂ pale brown, pale pubescence; collare and humeri ochraceous; pleuræ ochraceous; scutellum pale brown: ♀ deep brown, pale pubescence; collare and humeri pale reddish-brown; pleuræ pale reddish-brown; scutellum pale brown. Halteres pale reddish-brown at the base, the stalk and club with a blackish pubescence, the latter distinctly pyriform. Abdomen in the ♂ umber-brown on the dorsal segments, pale brown underneath and towards the extremity of the body, densely pubescent, particularly about the forceps, the latter large, pale brown: ♀ deep umber-brown superiorly, pale brown underneath, pale pubescence; lamellæ small,

pale brown. Legs long and slender, cinereous, rather longer in the ♀ than in the ♂; coxæ and base of femora in the ♀ pale reddish-brown in the ♀ greyish-yellow. Wings pellucid, very densely haired particularly at the tip, densely ciliated, with roseous and golden reflections, the latter very light in the ♀. First longitudinal vein somewhat wide of the costa, verging gradually into the margin; second longitudinal vein reaching the margin a short distance beyond the apex; cross-vein rather indistinct; third longitudinal vein turning abruptly towards the posterior border, anterior branch pale, nearly straight. (Description drawn from dried specimens).

*Hab.*—North Willoughby (Masters and Skuse). Beginning of December.

#### 56. DIPLOSIS ACTIOSA sp.n.

♂.—Length of antennæ.....	0.100 inch	...	2.54 millimètres.
Expansé of wings.....	0.090 × 0.040	...	2.27 × 1.01
Size of body.....	0.050 × 0.015	...	1.27 × 0.38
♀.—Length of antennæ.....	0.040 inch	...	1.01 millimètres.
Expansé of wings.....	0.100 × 0.040	...	2.54 × 1.01
Size of body.....	0.055 × 0.020	...	1.39 × 0.50

♂ Antennæ grey, basal joints large, having a somewhat yellowish tinge, flagellar joints small, globate, the alternate ones somewhat larger than the intermediate ones; verticils pale; each joint with a very long stiff hair on the upper side; pedicels increasing in length towards the end, where they are twice the length of the joints, the joints at the same time becoming gradually smaller; terminal joint with a slender projection: ♀ joints brown, cylindrical, subsessile, the pedicels very short, basal joints large, yellowish-brown, last joint ending in a small bud-shaped appendage; verticillate-pilose. Hypostoma and front yellowish. Palpi slender, yellowish. Thorax pale yellowish-brown, levigate, with long yellowish hairs; pleuræ and scutellum yellowish. Poisers naked and whitish at the base, the stem and club with brown scales. Abdomen greyish-brown, a dark brownish patch on the first two dorsal

segments, especially prominent in the ♀; densely covered with a pale pubescence. Legs long and slender. Coxæ yellowish. Femora yellowish at the base, anterior half dark grey. Tibiæ and tarsi cinereous, with a paler reflection. Wings pellucid, with a pale bluish tint, very densely haired, and having a rich golden reflection tinged with violet and purple in the ♂, much paler and brassy in the ♀. Veins pale brownish; costal well fringed; transverse vein rather indistinct; second longitudinal vein reaching the margin immediately beyond the apex of the wing; third longitudinal obscure, turning towards the margin in an abrupt rounded angle, anterior branch very indistinct. (Description drawn from dried specimens).

*Hab.*--Peat's Ferry (Masters and Skuse). August.

#### 57. DIPLOSIS CINERARIA, sp.n.

♂.—Length of antennæ... ..	0·100 inch	...	2·54 millimètres.
Expanse of wings.....	0·090 × 0·030	...	2·27 × 0·76
Size of body.....	0·050 × 0·015	...	1·27 × 0·38

Antennæ grey; basal joints large, pale brown; flagellar joints darker than the pedicels, alternate joints only slightly larger, ovate, each joint with long hairs on the upper side, pedicels longer than joints, last joint with a slender projection, verticils pale, rather dense. Hypostoma and front yellowish; palpi slender, yellowish. Thorax smoky, with a yellowish tint on the margins, nitidous, two rows of erect greyish hairs; scutellum yellowish-brown, haired; pleuræ yellowish-brown. Halteres black, whitish at the base of the stalk and tip of knob. Abdomen pale greyish-brown, covered with long erect greyish hairs, darker posteriorly on the first two or three segments. Legs cinereous, with a lighter reflection. Wings with a pale bluish tint, thickly haired, and having a brassy reflection. The costal and two first longitudinal veins pale; cross-vein indistinct; third longitudinal very indistinct, appearing only as a pale yellowish line lying in the longitudinal fold, posterior branch equally indistinct. (Description drawn from a dried specimen).

*Hab.*—Woronora (Masters and Skuse). October.

## 58. DIPLOSIS INDOTATA, sp.n.

♂.—Length of antennæ.....	0.070 inch	...	1.77 millimètres.
Expanse of wings.. ....	0.065 × 0.025	...	1.66 × 0.62
Size of body.....	0.040 × 0.010	...	1.01 × 0.25

Antennæ grey, joints rather darker than the pedicels, alternate joints somewhat larger, ovate; each joint with long stiff hairs on the upper side, pedicels longer than the joints, terminal joint with a slender projection, verticillate hairs moderately long and rather pale, basal joints sub-globular, brownish-grey, no larger than the flagellar joints. Hypostoma and front pale brownish; palpi very pale brownish, slender. Thorax dull yellowish-brown, with some long greyish hairs. Poisers black, the base yellowish. Abdomen greyish-brown on the anterior segments, the hinder segments dull yellowish-brown, densely covered with a long, bent, pale pubescence. Legs cinereous. Wings pellucid, with a pale yellowish tint, closely haired, costal and posterior angle deeply ciliated, with a weak brassy reflection. Veins pale brown. First longitudinal vein close to the costa; cross-vein pale, rather indistinct, long, not very oblique; second longitudinal vein considerably curved exteriorly, reaching the margin beyond the tip of the wing; third very indistinct. (Description drawn from dried specimen).

*Hab.*—Middle Harbour (Skuse). In November.

## 59. DIPLOSIS OREAS, sp.n.

♂.—Length of antennæ.....	0.090 inch	...	2.27 millimètres.
Expanse of wings.....	0.090 × 0.035	...	2.27 × 0.88
Size of body.....	0.070 × 0.020	...	1.77 × 0.50

Antennæ brownish, double joints about one and a half times as long as the simple ones; all the joints provided with long erect hairs above; pedicels of the double joints shorter; verticillate hairs not very dense, moderately long; basal joints pale brown; terminal process long and slender. Palpi sordid yellowish-brown. Thorax dull brownish, hinder margins and scutellum tinged with



ochraceous; short yellowish hairs in two longitudinal rows from the collare to the scutellum; pleuræ sordid brown. Halteres brownish, pale at the base of the stalk. Abdomen deep umber-brown, with long somewhat brownish and almost straight hairs; forceps paler brown, densely haired. Legs long, slender. Coxæ pale brown. Femora pale brown at the base, anterior half thickly covered with dark, almost sooty, scales. Tibiæ and tarsi appearing greyish-brownish. Wings pellucid, with a pale brown tint; pubescence dense, yellowish, the hairs very little bent; golden reflection, with a purplish tinge. Veins yellowish-brown. First longitudinal vein near to the costa and with it thickly haired; cross-vein indistinct; second longitudinal vein bent towards its end and reaching the margin of the wing immediately beyond the apex; third longitudinal pale, turning towards the margin at an obtuse rounded angle, anterior branch straight, a little bent upwards at the base. (Description drawn from dried specimen).

*Hab.*—Glenbrook, Blue Mountains (Masters). January.

Sub-genus 4. ASPHONDYLIA, Loew.

*Asphondylia*, H. Loew, D.B. IV. 1850, p. 21; Winnertz, L.E. 1853, p. 187; Rondani, Prodrômus I. 1856, p. 199, &c.; O.-Sacken, Mon. Dipt. N. America, 1862, p. 176; Schiner, F.A. II. 1864, p. 395; Lioy, Class. 1863-64, p. 503 (*Cylindrocera*).

Second longitudinal vein reaching the margin of the wing a little beyond the apex (Pl. II., fig. 8). Antennæ of both sexes with the same number of joints; joints cylindrical, sessile, with a short pubescence only.

60. ASPHONDYLIA LOEWI, sp.n.

♀.—Length of antennæ.....	0·040 inch	...	1·01 millimètres.
Expanse of wings.....	0·100 × 0·045	...	2·54 × 1·13
Size of body.....	0·090 × 0·025	...	2·27 × 0·62

Antennæ brown, 2- + 12-jointed, joints sessile, cylindrical, densely covered with a very short pale pubescence, joints decreasing in length towards the tip, the last joint apparently with a very



small nipple-shaped process. Labium and front brownish; palpi yellowish-grey. Thorax dark fuscous, minutely scabrous, somewhat shining, two rows of long erect yellowish hairs from the collare to the scutellum; humeri yellowish; collare and scutellum yellowish-brown. Halteres greyish, yellowish at the base, closely haired. Abdomen almost fuliginous, appearing lighter on account of its pale pubescence. Legs long and robust, greyish-brown, hoary when viewed in a certain light. Wings greyish-brown at the base, hyaline, very densely covered with a long and somewhat interwoven pubescence; dull margaritaceous reflections. Costal pale brown, thickly haired; two first longitudinal veins pale brown; second longitudinal vein slightly curved exteriorly, reaching the margin immediately below the apex of the wing; cross-vein very indistinct; third longitudinal pale. (Description drawn from dried specimen).

*Hab.*—Como (Masters and Skuse). September.

# 61. ASPHONDYLIA RUBICUNDA, sp.n.

♂.—Length of antennæ.....	0.050 inch	...	1.27 millimètres.
Expanse of wings.....	0.075 × 0.030	...	1.89 × 0.76
Size of body.....	0.080 × 0.020	...	2.02 × 0.50

Antennæ brown, 2-+12-jointed, basal joints yellowish-brown; joints of flagellum stout, sessile, cylindrical, more than twice as long as broad, densely covered with a very short greyish pubescence. Hypostoma and front pale reddish-brown. Palpi yellowish brown. Thorax nitidous, sordid yellowish-brown, with two rows of erect hairs enclosing a pale reddish-brown space; humeri pale reddish-brown; pleuræ and collare pale reddish-brown. Halteres pale reddish-brown, with a sparse pubescence. Abdomen pale reddish-brown, the terminal segments paler than the preceding ones, pale pubescence; forceps sordid yellowish-brown, densely haired. Legs short and robust. Coxæ pale reddish-brown. Femora yellowish-brown, upper side and tip blackish. Tibiæ and tarsi cinereous. Wings reddish-brown at

the root, densely haired; pale margaritaceous reflections. The costal and two first longitudinal veins pale brown; second longitudinal vein almost straight, joining the margin at the apex of the wing; third longitudinal vein pale; transverse vein very indistinct. (Description drawn from fresh specimen).

*Hab.*—Elizabeth Bay (Masters). December.

Sub-genus 5. *HORMOMYIA*, Loew.

*Hormomyia*, H. Loew, D.B. IV. 1850, p. 20; Winnertz, L.E. 1853, p. 188; Rondani, Stirp. Cec. 1860, pp. 287 and 293; O.-Sacken, Mon. Dipt. N. America, 1862, p. 176; Schiner, F.A. II. 1864, p. 396.

Second longitudinal vein reaching the margin of the wing at or beyond the apex (Pl. II, fig. 9). Thorax more or less gibbose, frequently extending over the head in the form of a hood. Antennæ pedicelled in the ♂; pedicelled or sessile in the ♀; number of joints varying from 2 + 12 to 2 + 34.

a. *Thorax more or less gibbose.*

62. *HORMOMYIA LUTULENTA*, sp.n.

♂.—Length of antennæ..... 0·070 inch ... 1·77 millimètres.  
 Expanse of wings..... 0·110 × 0·040 ... 2·79 × 1·01  
 Size of body..... 0·070 × 0·010 ... 1·77 × 0·25

Antennæ pale brown, as long as the body, 2- + 12-jointed, the joints double, sub-cylindrical, rather longer than the pedicels, with long straight verticils; joints gradually becoming smaller towards the tip, last joint conical. Palpi short, pubescent. Thorax moderately gibbose, reddish-brown, nitidous, with a yellowish pubescence; scutellum almost round, pubescent, dull yellowish-brown; pleuræ dull yellowish-brown. Halteres yellowish at the base, the stalk with a brownish pubescence; club somewhat pyriform, yellowish. Abdomen deep reddish-brown, densely

clothed with a yellowish or brownish-yellow pubescence. Legs moderately long and slender, ochraceous, with a pale pubescence. Wings pellucid, with a very pale brown tint; densely covered with a somewhat interwoven pubescence, deeply ciliated on the posterior angle, and reflecting margaritaceous tints when viewed at a certain obliquity. Veins brown, the costal thickly haired. First longitudinal vein wide of the costa, joining more than half way to the apex of the wing; second longitudinal vein bent exteriorly after leaving the cross-vein, joining the margin immediately beyond the apex of the wings; cross-vein distinct, rather oblique, situated at a point about two-thirds of the length of the first longitudinal vein from the base; third longitudinal vein very indistinct, the anterior branch almost invisible. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Skuse).

b. *Thorax extending over the head in the form of a hood.*

Sub-genus 6. NECROPHLEBIA, sub-gen. nov.

Second longitudinal veins straight before the cross vein, reaching the margin of the wing beyond its tip (Pl. II., fig. 10). Cross-vein not very oblique. Third longitudinal vein without an anterior branch. Antennæ in the ♀ 2 + 12-jointed, joints sub-cylindrical, pedicelled; two sparse verticils on each joint.

### 63. NECROPHLEBIA VOLITANS, sp.n.

♀.—Length of antennæ.....	0.050 inch	...	1.27 millimètres.
Expanse of wings.....	0.150 × 0.060	...	3.80 × 1.54
Size of body.....	0.100 × 0.030	...	2.54 × 0.76

Antennæ sordid grey, 2 + 12-jointed, joints sub-cylindrical, darker than and twice as long as the pedicels, two verticils to each joint, hairs somewhat sparse, light, and not very long, basal joints brown, the first more than twice the length of, and thicker than the second. Labium and palpi faded yellowish or brownish-yellow; the three first joints of the palpi of the same length, almost cylindrical, the fourth joint one-half longer than the others and more slender. Thorax brownish-red, levigate, with two rows

of yellowish hairs; scutellum paler, villose; pleuræ darker than the scutellum, pale brownish-red. Halteres greyish, the knob much darker than the stalk. Abdomen brownish-red, the last two or three segments lighter, with a yellowish pubescence. Legs pinkish-yellow, joints slightly tipped with brownish-red. Wings hyaline, thickly covered with a somewhat long and bent pubescence, and having a margaritaceous reflection. Veins pale brownish. Costal very strong, thickly haired; first and second longitudinal veins paler than the costa, second longitudinal vein reaching the wing-margin beyond its tip; cross-vein pale, but distinct; third longitudinal vein becoming paler towards its end, though visible throughout its length; no anterior branch. (Description drawn from dried specimen).

*Hab.*—Middle Harbour (Skuse) and Woronora (Masters).

*Obs.*—The structure of the antennæ, palpi, and ovipositor seems to exhibit the closest approach to *Hormomyia*. The wing is in shape very much like that of *Asynapta pectoralis* figured by Winnertz (Linnæa Entomol. viii., 1853); the venation, however, is similar to that ordinarily seen in the wing of *Diplosis*, but wanting an anterior branch to the third longitudinal.

#### Sub-genus 7. CHASTOMERA, sub-gen. nov.

First longitudinal vein very wide of the costa; second longitudinal vein reaching the margin beyond the apex of the wing; cross-vein long, a little oblique, situated a short distance from the tip of the first longitudinal vein; third longitudinal with no trace of an anterior branch (Pl. II., fig. 11). Antennæ in the ♀ pedicelled, verticillate.

#### 64. CHASTOMERA BELLA, sp.n.

♀.—Length of antennæ.....	0·070 inch	...	1·77 millimètres.
Expanse of wings.....	0·140 × 0·050	...	3·55 × 1·27
Size of body .....	0·130 × 0·025	...	3·30 × 0·62

Antennæ half as long as the wings, 2- + 14-jointed; basal joints light reddish-brown; second basal joint almost globose; flagellar joints niveous, almost pyriform, with numerous whorls of hair,

the basal whorl much longer than the rest ; terminal joint with a slender projection ; pedicels not quite the length of the joints. Hypostoma and front reddish-brown. Palpi long, thickly haired, ochraceous-ferruginous ; first joint twice as long as the second ; second and third joints thicker, of equal length ; last joint slender, one-half longer than the second or third, curved. Thorax reddish-ochraceous, nitidous ; two rows of white hairs from the collar to the scutellum ; a few long erect white hairs in front of the wings ; scutellum prominent, rounded-oblong, with a greyish tint. Poisers niveous, with silvery white hairs ; club gradually thickened. Abdomen acuminate, nitidous, cretaceous-white, with a silvery white pubescence ; lamellæ small, niveous, with fine silvery white hairs. Legs moderately long, niveous, densely clothed with very long semi-erect silvery white hairs ; a sooty-black ring just before the tip of the femora, another at the tip of the tibiæ, a third almost covering the first small tarsal joint, and a broader and paler ring at the tips of the next three following joints. Wings large, very densely covered with somewhat interwoven hairs surrounded by short dense cilia ; hairs and veins niveous ; the costal vein with a sooty-black spot just before the joining of the first longitudinal vein, the underlying portion of the first and second and longitudinal veins and the whole of cross-vein sooty-black, also a correspondingly broad but lighter spot towards the tip of the third longitudinal vein ; surface of wing with a pale bluish reflection, very faint on account of its dense pubescence. First longitudinal vein very wide of the margin, joining the costa beyond the middle ; second longitudinal vein considerably bent exteriorly after leaving the cross-vein, reaching the margin much beyond the apex of the wing ; cross-vein somewhat oblique, most distinct, situated a short distance from the tip of the first longitudinal vein, and at a point more than three-fourths of the length of the latter from the base ; third longitudinal vein most distinct, starting a short distance from the base of the second longitudinal vein, very little arcuated, reaching the posterior border about half-way to the tip ; no trace of an anterior branch. (Description drawn from fresh specimen).



*Hab.*—Gosford (Skuse). February.

*Obs.*—I have taken only one specimen of this eminently distinct form; and it is without doubt the most beautiful of all the known Australian Cecidomyidæ. It appears to have a close affinity to *Necrophlebia*, but the examination of further specimens may alter my conviction.

Sub-genus 8. COLPODIA, Winnertz.

*Colpodia*, Winnertz, L.E. 1853, p. 188; O.-Sacken, Mon. Dipt. N. America, 1862, p. 176; Schiner, F.A. II. 1864, p. 409.

Second longitudinal vein forming a curve before the cross-vein, and joining the margin a little beyond the apex of the wing (Pl. II., fig. 12). Cross-vein large, oblique. Antennæ pedicelled in both sexes; the number of joints uncertain; joints verticillate.

65. COLPODIA INDUBITATA, sp.n.

♂.—Length of antennæ.....	0.065 inch	...	1.64 millimètres.
Expanses of wings.....	0.065 × 0.020	...	1.64 × 0.50
Size of body.....	0.050 × 0.010	..	1.27 × 0.25

Antennæ pale brown, 2- + 14-jointed, joints sub-cylindrical, towards the tip appearing almost ovate, separated by pedicels longer than the joints; verticillate hairs sparse, very long and fine; basal joints large. Palpi yellowish-brown. Thorax ochraceous-brown, levigate, two rows of yellowish-brown hairs; pleuræ and scutellum sordid yellow. Halteres yellow at the base, the stalk and club densely covered with a brown pubescence, gradually incrassate. Abdomen slender, slightly tapering, first three segments ochraceous-brown, the rest yellowish above and ochraceous-brown underneath, densely pubescent. Legs long and slender, of a uniform sordid yellow, densely clothed with a fine pubescence. Wings narrow, moderately haired on the surface, margins sparingly ciliated; roseous reflections. Veins yellowish; costal vein thick; first longitudinal vein close to the costal; cross-vein distinct, joining the first longitudinal vein about the middle second longitudinal vein prominent, reaching the margin



considerably below the apex of the wing; third longitudinal vein running close to the posterior margin, indistinct, particularly at its extremity. (Description drawn from dried specimen).

*Hab.*—Middle Harbour (Skuse). September.

*Obs.*—I believe this is only the second species of the genus known. Winnertz described the first-discovered species from Germany, and established this genus in 1853.

#### Sub-section B.

Cross-vein very oblique, originating at the root of the first longitudinal vein.

#### Sub-genus 9. DIRHIZA, Loew.

*Dirhiza*, H. Loew, D.B. IV. 1850, p. 21; Winnertz, L.E. 1853, p. 186; Rondani, Stirp. Cec. 1860, pp. 287 and 293; O.-Sacken, M. Dipt. N. America, 1862, p. 176.

Second longitudinal vein hardly undulating before the cross-vein; joints of the antennæ sessile or almost sessile in both sexes.

*Obs.*—Only a single species has been described, *D. lateritia*, from Europe.

#### Sub-genus 10. EPIDOSIS, Loew.

*Epidosis*, H. Loew, D.B. IV. 1850, p. 21; Rondani, 11<sup>da</sup> Mem. Parma, 1840, &c.; Winnertz, L.E. 1853, pp. 186 and 189; O.-Sacken, Mon. Dipt. N. America, 1862, pp. 176 and 177; Schiner, F.A. II. 1864, p. 402.

Second longitudinal vein sinuose before the cross-vein (Pl. II., fig. 13); joints of the antennæ pedicelled in both sexes; their number variable.

#### 66. EPIDOSIS DISTENTA, sp.n.

♀.—Length of antennæ.....	0·050 inch	...	1·27 millimètres.
Expanse of wings.....	0·140 × 0·045	...	3·55 × 1·13
Size of body.....	0·080 × 0·020	...	2·02 × 0·50

Antennæ rather longer than the head and thorax, pale brown, 2- + 11-jointed, the joints long, sub-cylindrical, with long verticillate hairs; pedicels very short. Front and palpi pale brownish, the

palpi nearly half as long as the antennæ. Thorax pale, somewhat reddish-brown, nitidous, with long erect hairs; humeri and anterior border, scutellum, and pleuræ ochraceous. Halteres long, slender, yellowish. Abdomen light umber-brown, very densely clothed with pale semi-erect hairs. Legs very long and slender, densely haired. Coxæ pale reddish-brown. Femora and tibiæ pale umber-brown. Tarsi pinkish from the tip of the second joint, and having a hoary reflection. Wings hyaline, very thickly covered with a somewhat interwoven pubescence; dull roseous and brassy reflections; moderately ciliated. Veins brown. First and second longitudinal veins very distinct, the latter reaching the margin below the apex of the wing. Cross-vein distinct. Third longitudinal vein pale and rather indistinct, turning abruptly towards the posterior border; anterior branch curving upwards from the posterior branch, then taking a straight course. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Skuse). Beginning of December.

#### 67. EPIDOSIS MAGNIFICA, sp.n.

♂.—Length of antennæ.....	0.100 inch	...	2.54 millimètres.
Expanse of wings.....	0.140 × 0.040	...	3.55 × 1.01
Size of body.....	0.060 × 0.020	...	1.54 × 0.50

Antennæ whitish with a tinge of yellow towards the base, 2-+20-jointed; basal joints pale brown; first joints pale brown; first basal joint very large; flagellar joints more than half as long as the pedicels, sub-cylindrical, rather longer than broad, ornamented with whorls of extremely long hairs; joints and pedicels becoming smaller towards the tip, last joint very slender, sub-sessile. Hypostoma and front brownish-yellow, palpi very long, covered with hairs, brownish-yellow. Thorax brown with a greyish reflection, two longitudinal rows of pale semi-erect hairs; humeri and anterior margin ochraceous; pleuræ ochraceous-brown; scutellum ochraceous, with pale hairs. Halteres long, stalk slender, yellowish at the base; club globose, dusky. Abdomen reddish-brown, densely covered with a pale pubescence; pincers darker.

Legs very long, slender, greyish, with paler articulations; two last joints of the tarsi pale saffron-yellow, with a hoary reflection. Wings pellucid, with a pale bluish tint, thickly haired, densely and moderately deeply ciliated; reflections pale aurichalceous. First longitudinal at first wide of the costa, running gradually into it at beyond a third of the distance from the tip of the wing; cross-vein almost straight and parallel with the first longitudinal; second longitudinal very sinuose before reaching the cross-vein, and at that point almost touching the first longitudinal vein, joining the margin beyond the apex of the wing; third longitudinal with its branches indistinct. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters). January.

68. EPIDOSIS GRACILIS, sp.n.

♂.—Length of antennæ.....	0·110 inch	...	2·79 millimètres.
Expanse of wings.....	0·130 × 0·040	...	3·30 × 1·01
Size of body.....	0·070 × 0·015	...	1·77 × 0·38

Antennæ brownish-yellow, 2+14-jointed; basal joints subglobose; flagellar joints on the basal half cylindrical, more than twice as long as broad; towards the tip becoming shorter, subcylindrical; terminal joint rudimentary, conical, sessile; pedicels at the base as long as the joints, towards the tip almost twice their length; verticils long. Thorax deep brown, nitidous, with brownish hairs; humeri yellowish; pleuræ brownish-yellow; scutellum brownish-yellow, with long erect hairs. Halteres long, densely haired, the club large, pyriform. Abdomen dusky-brown, densely haired; the last segment with light reddish-brown forceps. Legs long and slender, dusky-yellow; tip of the third, and the fourth and fifth tarsal joints pale yellowish, with a hoary reflection. Wings pellucid, with a very pale bluish tint, densely pubescent, particularly at the tip; brassy reflection, chalybeous along the venation. Cross-vein very pale, almost straight, diverging from the first longitudinal at its tip; second longitudinal not very

sinuose before the cross-vein, at the joining of the cross-vein only a very short distance from the first longitudinal, and reaching the wing-margin beyond the apex; both branches of the third longitudinal vein very indistinct. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Skuse).

#### 69. EPIDOSIS OPIPARA, sp.n.

♀.—Length of antennæ.....	— inch	...	— millimètres.
Expanse of wings.....	0.100 × 0.040	...	2.54 × 1.01
Size of body.....	0.070 × 0.020	...	1.77 × 0.50

Antennæ yellowish (number of joints not known, a portion being broken off both antennæ), joints cylindrical, rather longer than broad, verticillate-pilose, about four times as long as the pedicels. Palpi yellowish. Thorax faded reddish-brown, pale hairs; humeri whitish; scutellum whitish, with a few long pale hairs. Halteres whitish, stalk long and slender, club somewhat small and almost globose. Abdomen greenish-yellow, with pale hairs; ovipositor long, with a brownish tinge. Legs long and slender. Coxæ sordid yellowish. Femora whitish for the greater part of their length, terminating with yellowish-grey. Tibiæ and tarsi yellowish-grey. Wings pellucid, with a very faint bluish tint; densely haired, particularly at the tip; and bright purple and violet reflections. Cross-vein pale, almost straight; second longitudinal vein very sinuose before the cross-vein, meeting the cross-vein close to the first longitudinal, joining the margin of the wing beyond the apex; third longitudinal vein indistinct. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters).

#### 70. EPIDOSIS CONFERTA, sp.n.

♀.—Length of antennæ.....	0.060 inch	...	1.54 millimètres.
Expanse of wings.....	0.100 × 0.040	...	2.54 × 1.01
Size of body.....	0.070 × 0.010	...	1.77 × 0.25

Antennæ rather more than half the length of the wings, brownish-yellow, 2- + 11-jointed, the last one small and rudimentary; joints more than twice as long as broad, cylindrical; moderately long verticils; pedicels at the base longer than the joints, towards the tip gradually becoming smaller, that of the terminal joint very small. Thorax yellowish-brown, with two rows of brownish hairs from the collare to the scutellum; humeri pleuræ and scutellum ochraceous. Poisers yellowish, with a dusky pubescence, stalk slender, club elongate. Abdomen dirty-yellow, pale between the segments; pale pubescence; ovipositor apparently short. Legs long, somewhat robust. Coxæ ochraceous. Femora yellowish-grey, darker along the front side. Tibiæ, first tarsal joint and greater part of the second yellowish-grey, remainder yellow, becoming paler towards the end of the last joint. Wings densely and evenly haired, deeply ciliated on the posterior border, with pale violaceous reflections. First longitudinal vein long, rather closely approximated to the costa; cross-vein rather indistinct, visible at the joining as a short very oblique vein; second longitudinal vein hardly sinuose at the base, bending anteriorly close to the first longitudinal at the cross-vein, reaching the margin beyond the apex of the wing; third longitudinal most indistinct. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters).

#### 71. EPIDOSIS PEREXILIS, sp.n.

♂.—Length of antennæ.....	0.100 inch	...	2.54 millimètres.
Expanse of wings.....	0.120 × 0.040	...	0.50 × 1.01
Size of body.....	0.060 × 0.010	...	1.54 × 0.25

Antennæ pale yellow, 2- + 19-jointed, terminal joint rudimentary, sessile; joints of the flagellum sub-cylindrical, at the base almost sub-globose, same length and breadth, towards the end smaller, longer than broad, very long whitish verticils, pedicels a little longer than the joints. Palpi moderately long, pale brownish,

with a light pubescence. Thorax ochraceous, nitidous, with pale hairs; collare, pleuræ and scutellum ochraceous. Halteres whitish, stalk slender, club elongate. Abdomen yellow, with a pale pubescence. Legs very long, slender. Coxæ yellowish; remaining joints white. Wings pellucid, with a very pale bluish tint; densely haired, especially towards the tip; and a pale silvery reflection. Veins whitish. First longitudinal parallel with the costa for two-thirds of its length, then gradually merging into the margin; cross-vein and second longitudinal vein very distinct, one continuous straight line, close to and parallel with the first longitudinal at the base, bending exteriorly at about two-thirds of its length, joining the wing-margin beyond the apex; the sinuose portion is very undulated, very pale, and appears not part of the second longitudinal vein; third longitudinal vein very pale and indistinct; anterior branch only distinguishable with difficulty. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Skuse).

## 72. EPIDOSIS PALLIDA, sp.n.

♂.—Length of antennæ.....	0·080 inch	...	2·02 millimètres.
Expanse of wings.....	0·080 × 0·030	...	2·02 × 0·76
Size of body.....	0·050 × 0·008	..	1·27 × 0·20
♀.—Length of antennæ.....	0·050 inch	...	1·27 millimètres.
Expanse of wings.....	0·100 × 0·040	...	2·54 × 1·01
Size of body.....	0·070 × 0·010	...	1·77 × 0·25

Antennæ yellowish; ♂ 2-+14-jointed, joints sub-cylindrical, rather longer than broad, with very long verticillate hairs, on pedicels about one and a-half times as long as a joint, becoming gradually smaller towards the tip, terminal joint conical, subsessile: ♀ 2-+11-jointed, joints almost fusiform, verticillate-pilose, three times as long as the pedicels. Palpi and front yellowish. Thorax light brown, with rather long yellowish hairs; humeri yellowish; pleuræ ochraceous-brown; scutellum yellowish-white with a few hairs. Halteres somewhat short, densely haired, club



pyriform. Abdomen ochraceous-brown, covered with a pale, yellowish pubescence; ♀ ovipositor short. Legs long and slender, greyish-yellow, with a dense pubescence, appearing somewhat longer in the ♂. Wings pellucid, with a pale bluish tint, thickly and uniformly haired, moderately ciliated, with roseous and golden reflections when viewed at a certain obliquity. Veins yellowish-brown. Membrane of wing tinted with brown between the costa and the first longitudinal vein. Cross-vein very oblique, not discernible for more than a fourth of its length from the second longitudinal vein; second longitudinal vein a little sinuose before the cross-vein, joining the margin just beyond the tip of the wing; third longitudinal vein turning rather abruptly towards the posterior margin; anterior branch indistinct. (Description drawn from dried specimens).

*Hab.*—Elizabeth Bay (Skuse). July.

### 73. EPIDOSIS MACELLA, sp.n.

♀.—Length of antennæ.....	0.035 inch	...	0.88 millimètre.
Expanse of wings.....	0.070 × 0.025	...	1.77 × 0.62
Size of body.....	0.050 × 0.010	...	1.27 × 0.25

Antennæ brownish-yellow, 2-+11-jointed, joints almost fusiform, verticillate-pilose, sub-sessile; terminal joint sessile. Palpi and front yellow. Thorax somewhat brownish-yellow, with yellow hairs; humeri whitish; pleuræ yellow; scutellum small and narrow, yellowish-white. Halteres yellowish, white at the base, slightly increasing in thickness towards the apex, but hardly clubbed. Abdomen yellow, densely covered with a yellowish pubescence; ovipositor short; lamellæ very small, elongate, yellowish. Legs moderately long, slender, almost brownish-yellow, very densely haired. Wings pellucid, with a pale bluish tint, not densely haired, thicker towards the apex, almost uniformly ciliated round the whole margin; bright brassy reflection. First longitudinal near the costa, imperceptibly joining; second longitudinal vein hardly sinuose before the cross-vein, and not so

well defined or appearing part of the remainder of the vein, joining the wing-margin at or immediately below the apex ; cross-vein and second longitudinal apparently continuous, the former very oblique ; third longitudinal vein very indistinct, particularly the anterior branch. (Description drawn from dried specimen).

*Hab.*—Sydney (Skuse).

74. *EPIDOSIS EXIGUA*, sp.n.

♀.—Length of antennæ.....	0·030 inch	...	0·76 millimètre.
Expanse of wings.....	0·070 × 0·035	...	1·77 × 0·88
Size of body.....	0·050 × 0·010	...	1·27 × 0·25

Antennæ pale brown, 2- + 11-jointed ; joints cylindrical, twice as long as broad, verticillate-pilose, longer than the pedicels ; pedicels pale ; terminal joint sessile. Palpi short, rather thick, brownish-yellow. Hypostoma and front brownish-yellow. Thorax pale brown, with the usual two rows of brownish-yellow hairs ; pleuræ pale brown ; scutellum somewhat yellowish-brown ; humeri same colour as the thorax. Halteres ochraceous, rather short, densely covered with minute yellow hairs, club elongate, scarcely pyriform. Abdomen yellowish-brown, reddish-brown towards the extremity, thickly haired. Legs moderately long, slender, yellow, densely covered with long and short hairs. Wings broad, pellucid, with a pale bluish tint, covered with a rather dense and somewhat interwoven pubescence ; moderately ciliated ; with roseous and golden reflections. First longitudinal vein wide of the costa and parallel with it, then joining the margin at an acute angle ; cross-vein a short distance from and almost parallel with the first longitudinal vein, and forming with the second longitudinal vein one continuous straight line ; second longitudinal very sinuose at the base, and much paler than the rest of the vein, reaching the margin just beyond the apex of the wing ; third longitudinal vein wide of the margin, bending gradually into the posterior border ; no trace of an anterior branch. (Description drawn from dried specimen).

*Hab.*—Glenbrook, Blue Mountains (Masters).

## 75. EPIDOSIS GIBBEROSA, sp.n.

♀.—Length of antennæ.....	0·040 inch	...	1·01 millimètres.
Expanse of wings .....	0·080 × 0·030	...	2·02 × 0·76
Size of body .....	0·070 × 0·015	...	1·77 × 0·38

Antennæ light reddish-brown, 2- + 11-jointed, half the length of the wings ; first basal point almost pyriform, twice as long as the second, the latter globose ; flagellar joints almost fusiform, with a clavate pedicel at the apical end ; joints three times as long as the pedicels ; verticels sparse, moderately long. Thorax considerably gibbose ; light umber-brown, nitidous, with yellowish hairs ; pleuræ dull ochraceous-brown ; scutellum paler umber than the thorax, prominent, rounded-oblong. Poisers ochraceous-brown. Abdomen umber brown, with yellowish hairs ; ovipositor apparently short, no visible lamellæ. Legs moderately long, robust, umber brown, thickly haired ; tip of the fourth and remaining joints of the tarsi white ; third tarsal joint very little longer than the fourth. Wings pellucid, with a very pale brownish tint, anterior margin with a dense moderately long uniform fringe from the base to the end of the second longitudinal vein. First longitudinal vein rather close to the costa ; second longitudinal vein a little sinuose before the transverse vein, reaching the margin immediately beyond the apex ; cross-vein distinctly visible from the root of the first longitudinal ; third longitudinal vein almost straight, anterior branch scarcely distinguishable, close to the posterior border (Pl. II., fig. 14). (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters).

*Obs.*—This description was drawn from two imperfect specimens, but they belong to such a distinct species that it cannot fail to be recognised from the above ; it almost appears to me that this species should inaugurate a new sub-genus.

## Section II.

Wings with four longitudinal veins.

Sub-genus II, *ASYNAPTA*, Loew.

*Asynapta*, H. Loew, D.B. IV. 1850, p. 21 ; Winnertz, L.E. 1853, p. 189 ; Rondani, Stirp. Cec. 1860, pp. 287 and 293 ; O-

Sacken, Mon. Dipt. N. America, 1862, p. 177 ; Schiner, F.A. II. 1864, p. 405.

Cross-vein sometimes as in section A, then the second longitudinal vein is not sinuated ; sometimes as in section B, and then the second longitudinal vein is sinuated (as in *Epidosis*) ; in this case also the collare is a little prolonged (Pl. III., figs. 15 and 16).

a. *Second longitudinal vein and cross-vein as in Epidosis.*

76. *ASYNAPTA FLAMMULA*, sp.n.

♀.—Length of antennæ.....	0·020 inch	...	0·50 millimètre.
Expanse of wings.....	0·090 × 0·040	...	2·28 × 1·01
Size of body.....	0·058 × 0·018	...	1·47 × 0·45

Antennæ brownish, 2-+16-jointed, moniliform ; joints subglobular, gradually decreasing in size towards the tip ; no visible pedicels ; the verticillate hairs short and rather light. Head brownish, with a few light hairs. Palpi yellowish-brown. Thorax reddish-brown ; collare brownish ; pleuræ yellowish-brown. Halteres short, pear-shaped, yellowish-brown, thickly covered with fine hairs. Legs moderately long, yellowish, with a short delicate pubescence having a whitish reflection. Abdomen light reddish-brown, with a fine pubescence. Wings iridescent, with a fiery reflection when viewed in a certain light, rather thick pubescence ; moderately long fringe on the anterior and posterior margins and posterior angle ; costal vein pale brownish ; first longitudinal vein short, wide of the margin ; second longitudinal vein sinuose before the cross-vein, joining the border of the wing about the apex ; third longitudinal vein most indistinct throughout its length, particularly at the base, only very little curved exteriorly towards its end, reaching the border of the wing a short distance below the apex ; fourth longitudinal vein rather indistinct, but more apparent than the last, turning towards the posterior margin in an obtuse rounded angle. (Description drawn from dry specimen).

*Hab.*—Sydney (Masters).

b. *Second longitudinal vein and cross-vein as in Diplosis.*

77. *ASYNAPTA PRISCA*, sp.n.

♂.—Length of antennæ.....	0.080 inch	...	2.02 millimètres.
Expanse of wings.....	0.110 × 0.045	...	2.79 × 1.13
Size of body.....	0.100 × 0.027	...	2.54 × 0.67

Antennæ greyish, 2- + 12-jointed, joints sub-cylindrical, thick, longer than the pedicels; pedicels paler than the joints; verticillate hairs greyish, very long, rather dense, straight; basal joints somewhat flattened, the first larger than the second. Hypostoma and front brown; palpi brown, thick, very hairy. Thorax deep reddish-brown, appearing almost black, nitidous, with a dispersed pubescence. Halteres yellowish, the base of the club with a brownish tinge. Abdomen deep reddish-brown, the red predominating on the dorsal segments, sparingly haired. Legs long and slender. Coxæ yellowish-brown. Femora, tibiæ, and tarsi yellowish, with a close pubescence, appearing greyish in an oblique direction. Wings yellowish-brown at their insertion, densely clothed with long hairs, moderately ciliated on the posterior border, and having very little reflection. Veins pale; first longitudinal vein wide of the costa, reaching the margin half-way to the tip; second longitudinal vein not sinuated before the cross-vein, joining the costal immediately beyond the apex of the wing; transverse vein distinct, very oblique, running parallel to the first longitudinal for half its length before joining; third longitudinal vein rather indistinct at the base, very little curved exteriorly; fourth longitudinal very distinct, turning towards the margin in an obtuse rounded angle. (Description drawn from fresh specimen).

*Hab.*—Elizabeth Bay (Masters). Beginning of December.

78. *ASYNAPTA PARIETINA*, sp.n.

♀.—Length of antennæ.....	0.025 inch	...	0.62 millimètre.
Expanse of wings.....	0.070 × 0.030	...	1.77 × 0.76
Size of body.....	0.060 × 0.015	...	1.54 × 0.38

Antennæ almost cinereous, 2- + 12-jointed, about as long as the head and thorax, joints rather longer than wide, sessile, with very short verticillate hairs, basal joints small, yellowish-brown. Hypostoma and front yellowish-brown. Palpi yellowish-brown. Thorax black, slightly pubescent; pleuræ sordid yellowish-brown; scutellum yellowish. Halteres short, the club large, pyriform, grey, with exceedingly minute brown scales. Abdomen black with a yellowish tint, densely covered with moderately long hairs; ovipositor long, with two small yellow lamels. Legs moderately long, slender, yellowish-grey; femora and tibiæ with brownish hairs. Wing densely covered with longish somewhat interwoven pubescence, iridescent, with roseous and golden reflections. Veins pale brownish. First longitudinal vein wide of the costa, joining the margin about half way to the tip; cross-vein very prominent, rather oblique; second longitudinal vein not sinuated before the cross-vein, reaching the margin immediately beyond the apex of the wing; third longitudinal vein almost straight, slightly bent just before joining the posterior margin; fourth longitudinal vein turning towards the margin in an obtuse rounded angle. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters and Skuse). January.

#### Genus 4. SPANIOCERA, Winnertz.

*Spaniocera*, Winnertz, L.E., 1853, pp. 190 and 306; Rondani, II<sup>da</sup> Mem. Parma, 1840, &c.; *Brachyneura*, Stirp. Cec., 1860, pp. 287 and 292; O.-Sacken, Mon. Dipt. N. America, 1862, p. 175; Schiner, F.A. II., 1864, p. 406.

Antennæ filiform, 2- + 11-jointed, the joints long, cylindrical, with a short pubescence, and without verticils. Wings moderately large; considerably rounded, with a wedge-shaped base; clothed with scaly hairs. Three longitudinal veins, all simple. The first longitudinal vein close to the costa; second longitudinal vein some distance from it, arcuating anteriorly, and reaching the margin considerably before the apex of the wing (Pl. III., fig. 17).



*Obs.*—I have as yet failed to detect any Australian species referable to this; and the type, *S. squamigera*, is I believe the only known species.

#### Genus 5. LASIOPTERA, Meigen.

*Lasioptera*, Meigen, S.B. I., 1818, p. 88, pl. III.; *Lasiopteryx*, Stephens; Macquart, S. à B.I., 1834, p. 162; Rondani, II<sup>da</sup> Mem. Parma, 1840, &c.; H. Loew, D.B. IV., 1850, p. 21; Zetterstedt, D.Sc., IX., 1850, p. 3699; Winnertz, L.E., 1853, p. 191; Walker, I.B. III., 1856, p. 132; O.-Sacken, Mon. Dipt. N. America, 1862, p. 175; Schiner, F.A. II., 1864, p. 406.

Antennæ from 2-+14- to 2-+32-jointed; joints sub-globose, sessile, with short verticillate hairs. Wings rather short and broad; with or without a white spot on the middle of the anterior border. Three longitudinal veins, the first and second running so near the costa as to be hardly discernible; no cross-vein (Pl. III., fig. 18).

A. *Wings with a white spot on the middle of the anterior border.*

#### 79. LASIOPTERA MASTERSI, sp.n.

♀.—Length of antennæ.....	0.025 inch	...	0.62 millimètre.
Expanse of wings.....	0.110 × 0.040	...	2.79 × 1.01
Size of body.....	0.090 × 0.030	...	2.27 × 0.76

Antennæ black, 2-+15-jointed, joints about as long as broad, sessile, with a short hoary pubescence; two basal joints brownish. Head black with a golden pubescence, front hoary. Thorax shining black, with two longitudinal rows of erect golden hairs, sparingly haired from the collare down to the origin of the wings, bare anteriorly. Halteres yellowish. Abdomen pale reddish-brown, each segment with a row of black scales, the hinder segments also with rows of white scales. Coxæ brown, hoary. Femora black on the upper side and tip, laterally and the outermost extremity of the tip whitish. Tibiæ brown inclined to black. Tarsi whitish. Wings with a bluish reflection, hairs on the surface and fringe grey. Costal border covered with black

scales, with a white spot at the junction with the second longitudinal vein. First longitudinal vein so close to the costa as to be hardly discernible; second longitudinal distinctly visible for the whole of its length. (Description drawn from dried specimen).

*Hab.*—Woronora (Masters and Skuse). October.

#### 80. LASIOPTERA VASTATRIX, sp.n.

♂.—Length of antennæ .....	0·025 inch	...	0·63 millimètre.
Expanse of wings.....	0·090 × 0·035	...	2·27 × 0·88
Size of body.....	0·090 × 0·020	...	2·27 × 0·50
♀.—Length of antennæ.....	0·023 inch	...	0·57 millimètre.
Expanse of wings.....	0·090 × 0·035	...	2·27 × 0·88
Size of body.....	0·095 × 0·030	...	2·39 × 0·76

Antennæ black or dark brown, in the ♂ 2- + 15-jointed, in the ♀ 2- + 14-jointed; joints sessile, sub-globular, rather longer than broad, smaller towards the end of the flagellum, with short pale pubescence. Palpi yellowish-brown. Thorax deep brown covered with golden-yellow scales and pubescence; two rows of erect hairs extending from the collare to the scutellum, short at the collare, increasing in length towards the hinder margin; some long hairs before the base of the wings (below this tuft and immediately in front of the origin of the wings is a small patch of white scales); pleuræ brown. Halteres pale brown at the base, white scales on the stalk, the club brown, darker in the ♀ than the ♂, with some scattered dark brown or black scales. Abdomen covered superiorly on each segment with deep brown scales, bordered behind with a band of white in the ♂, and yellowish in the ♀; this band in the ♂ is almost as broad as that of the brown scales; pale brown between the segments; pale brown underneath, covered with white scales; forceps in the ♂ densely covered with white scales and long hairs; ♀ ovipositor pale brownish, appearing somewhat blunt. Legs densely clothed with scales, appearing deep brown with pale reflections when viewed at a certain obliquity. Wings yellowish-brown at the root, hyaline, with a weak cupreous reflection;

deeply ciliated on the posterior border. Costal deep brown, thickly scaled, and having a yellowish-white spot at the junction with the second longitudinal vein. First and second longitudinal veins pale brown, the former short and close to the costa; third longitudinal very pale. (Description drawn from fresh specimens).

*Larva.*

Size of body...  $0.120 \times 0.035$  inch ...  $3.04 \times 0.88$  millimètres.  
Breast-bone...  $0.012$  ...  $0.30$

Oblong, bright saffron-yellow, glabrous, minutely granulate. Head distinct, retractile, with two very short pale yellowish antennæ near the tip. Breast-bone deep reddish-brown, visible for the whole of its length, of almost uniform width, exerted anteriorly for less than one-sixth of its length, with four triangular projections, the middle pair in advance of the lateral ones; posterior portion somewhat diaphanous. Stigmata very indistinct.

Inhabiting grass-stems, generally that portion underneath the spathe. The deformation caused is a scarcely perceptible swelling, extending from an inch to an inch and a-half in length, and containing from ten to a dozen larvæ, lying somewhat obliquely, enveloped in delicate white filmy cocoons. These larvæ have as yet only been found in a species of grass in the Parkes district, where they prove very destructive to the pasture.

*Pupa.*

Size of body...  $0.080 \times 0.040$  inch ...  $2.02 \times 1.01$  millimètres.

Oblong, pale, ochraceous-brown, obvolute; head bifid in front; thorax somewhat gibbose, nitidous, paler than the abdomen; abdomen minutely granulate, without spines.

Imagines began to emerge on the 5th December.

*B. Wings without a white spot on the anterior border.*

81. *LASIOPTERA AURATA*, sp.n.

♂.—Length of antennæ..... — inch ... — millimètres.  
Expanse of wings.....  $0.160 \times 0.060$  ...  $4.06 \times 1.54$   
Size of body.....  $0.130 \times 0.035$  ...  $3.29 \times 0.88$

Basal joints of antennæ (the remainder lost) golden-yellow. Head covered with golden-yellow scales. Palpi yellowish-brown. Thorax and abdomen pale brown, almost covered with golden-yellow scales, no bands. Pleuræ yellowish-brown. Halteres yellowish. Coxæ and femora golden-yellow. Tibiæ golden-yellow, black along the upper side. Tarsi black, except the two last joints, which are hoary when viewed in a certain oblique direction. Wings with a bluish reflection, hairs on the surface and fringe grey. Costal border covered with golden-yellow scales and hair to the end of the second longitudinal vein, except a longitudinal band of black scales near the base. First and second longitudinal veins close to the costa, yellowish, sparingly sprinkled with golden-yellow scales; base of the third longitudinal vein sparingly covered with black scales, branches of the fork indistinct. (Description drawn from dried specimen).

*Hab.*—Middle Harbour (Skuse). September.

## 82. LASIOPTERA NODOSÆ, sp.n.

♀.—Length of antennæ.....	0.030 inch	...	0.76 millimètre.
Expanse of wings....	0.080 × 0.040	...	2.02 × 1.01
Size of body.....	0.060 × 0.030	...	1.54 × 0.76

Antennæ sordid brown, 2- + 32-jointed; joints as long as broad, sessile, with a short greyish pubescence. Head black, with white scales and greyish hairs on the vertex. Palpi sordid yellow. Thorax deep brown, sprinkled with a very fine silvery pubescence; white scales from the collare to the base of the wings, also forming a rather prominent longitudinal band along the middle from the collare to the scutellum, and scattered along the hinder margin of the mesothorax. Halteres whitish, the knob tipped with brown, a number of very long silvery hairs in their vicinity. Abdomen black, each segment with a marginal fringe of short silvery hairs. Coxæ pale, with silvery pubescence. Femora whitish, brown towards the tip. Tibiæ brown, pale along one side and at the tip. Tarsi brown with a pale reflection. Wings beautifully

iridescent, and covered with fine almost straight hairs. Costal margin black, thickly covered with scales. First longitudinal vein hardly discernible when the scales are removed; second longitudinal vein also black and scaly, close to the costa; third longitudinal very indistinct. (Description drawn from dried specimen).

*Hab.*—Homebush. Bred from deformed buds of *Melaleuca nodosa*, obtained in November (Masters).

### 83. LASIOPTERA MISCELLA, sp.n.

♀.—Length of antennæ .....	0.030 inch	...	0.76 millimètre.
Expansé of wings.....	0.070 × 0.030	...	1.77 × 0.76
Size of body.....	0.070 × 0.020	...	1.77 × 0.50

Antennæ black, 2- + 32-jointed; joints depressed, decreasing in size towards the tip, with a dense pale pubescence; basal joints brown. Palpi reddish-brown, with white scales and hairs. Head black, white scales on the vertex. Thorax black, nitidous, with a few scales and hairs; pleuræ black with a tinge of brown; scutellum prominent, shining black. Halteres pale reddish-brown, the apical half of the club yellowish. Abdomen black superiorly, with white scales, and a row of pale hairs along the posterior border of each segment; reddish-brown underneath; ovipositor yellowish-brown. Legs moderately long, slender. Coxæ umber brown. Femora umber brown, with white scales and hairs. Tibiæ and tarsi umber brown, almost black, the former white at the extreme tip. Wings moderately haired, hyaline, with very little reflection. Costal and two first longitudinal veins brown, the first thickly covered with scales and hair; third longitudinal vein very pale and indistinct. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters). Beginning of January.

### 84. LASIOPTERA CORUSCA, sp.n.

♂.—Length of antennæ.....	0.020 inch	...	0.50 millimètre.
Expansé of wings.....	0.060 × 0.02	...	1.54 × 0.62
Size of body.....	0.040 × 0.010	...	1.01 × 0.25

Antennæ half as long as the body, 2-+16-jointed; flagellar joints deep brown or black, rather longer than broad, sessile, with a yellowish pubescence; basal joints pale ferruginous. Head deep brown or black with a golden pubescence on the vertex. Palpi yellowish-brown, with a yellowish pubescence. Thorax deep reddish-brown, with golden scales and hairs; humeri, scutellum, and pleuræ ferruginous-ochraceous; scutellum with golden scales and hairs. Halteres ferruginous on the stalk, the club elongate, almost pyriform, with a golden pubescence. Abdomen ferruginous, the dorsal segments with deep brown scales, posteriorly bordered with golden scales and long hairs; forceps light umber with a pale pubescence. Legs moderately long, slender. Coxæ, femora, and tibiæ ferruginous-ochraceous, with golden scales and pubescence. Tarsi covered with deep brown or black scales. Wings yellowish-brown at the roots, hyaline, with bright margaritaceous reflections. Costal and two first longitudinal veins yellowish-brown; the costal with deep brown scales and a short pubescence; third longitudinal vein very pale, but distinctly discernible, gradually arcuating into the posterior border; anterior branch nearly straight, almost as long as the whole of the posterior vein. (Description drawn from dried specimen).

*Hab.* - Gosford (Skuse). February.

*Obs.*—Six specimens taken on the wing in a shady situation, all proved to be males.

#### 85. LASIOPTERA HELVIPES, sp.n.

♂.—Length of antennæ.....	0.017 inch	..	0.42 millimètre.
Expanse of wings.....	0.060 × 0.030	...	1.54 × 0.76
Size of body .....	0.050 × 0.020	...	1.27 × 0.50

Antennæ pale brownish, 2-+17-jointed, sessile, with greyish pubescence. Head black or dark brown, with a pale pubescence on the vertex. Palpi yellowish. Thorax pale brown, with yellowish scales and hairs, an indistinct longitudinal band of scales down the middle. Halteres pale yellow. Abdomen covered with



black scales, except a pair of white spots on each of the first five segments. Legs sordid yellow. Wings with splendid reflections, hairs on the surface long, almost straight. Costal border deep brown, scaly. First longitudinal vein indiscernible; second longitudinal vein sordid brown, scaly; third longitudinal very indistinct. (Description drawn from dried specimen).

*Hab.*—Sydney (Masters).

#### Sub-genus. CLINORHYNCHA, Loew.

*Clinorhyncha*, H. Loew, D.B. IV., 1850, p. 21; Rondani, II<sup>da</sup> Mem. Parma, 1840, &c.; Winnertz, L.E., 1853, p. 192; O.-Sacken, Mon. Dipt. N. America, 1862, p. 175; Schiner, F. A. II., 1864, p. 409.

Characters the same as in *Lasioptera* with the difference that the mouth is prolonged in a rostrum.

*Obs.*—I cannot yet record any Australian species referable to this sub-genus. Up to the present I think all the known species have been described from Europe, and they only number three or four.

#### Sub-family II. LESTREMINA.

Wings with at least four longitudinal veins, or at most five, sometimes with a rudimentary vein behind the fifth; the additional (or third) vein is situated between the two longitudinal veins corresponding to the second and third of the first sub-family, and is generally furcate; ocelli nearly always present; first tarsal joint not shortened.

##### I. OCELLI EXTANT.

A. Wings with four longitudinal veins; the third not furcate; the fourth furcate, representing the fourth and fifth longitudinal veins of other genera, coalescent for the first half of their course.

##### Genus 1. CAMPYLOMYZA, Meigen.

*Campylomyza*, Meigen, S.B. I., 1818, p. 101; Macquart, S. & B. I., 1834, p. 150, pl. IV.; *Campylomyza* and *Neurolyga*, Rondani;

*Campylomyia*, Zetterstedt, D.Sc., IX., 1850, p. 3669; *Campylomyza*, Walker, I.B. III., 1856, p. 61; O.-Sacken, Mon. Dipt. N. America, I., 1862, p. 178; Schiner, F.A. II., 1864, p. 411; Winnertz, V. z.-b. G. Wien, 1870, p. 9.

Antennæ 2-+6- to 2-+23-jointed, moniliform, verticillate; joints ovate, lentiform or cylindrical, with long pedicels in the ♂, and short ones in the ♀, or sessile in both sexes. Wings large, considerably rounded at the apex; in some cases the base of the wings is cuneiform, in others the posterior angle is prominently rounded; hairs often scaly; long cross-vein\* (Pl. III., figs. 19 and 20).

a. *Wings cuneiformly narrowed at the base.*

#### 86. CAMPYLOMYZA PERPALLIDA, sp.n.

♀.—Length of antennæ..... 0·017 inch ... 0·42 millimètre.

Expanse of wings..... 0·035 × 0·017 ... 0·88 × 0·42

Size of body..... 0·040 × 0·008 ... 1·01 × 0·20

Antennæ pale brown, 2-+9-jointed; basal joints very large, paler than those of the flagellum; joints globose, verticillate-pilose, gradually becoming smaller towards the end; pedicels longer than the joints. Front and palpi yellowish-brown, densely covered with a somewhat scaly pubescence. Thorax pale brown, with yellowish hairs; pleuræ yellowish; scutellum rather paler than the mesothorax, almost lunate, pubescent. Halteres pale yellow, sprinkled with deep brown or black scales, the club elongate. Abdomen large, sparsely sprinkled with deep brown or black scales and scaly hairs; ovipositor apparently short, very pale yellowish, the lamellæ elongate, minutely ciliate. Legs short, rather slender, yellowish, with a pale pubescence; femora strongly developed; tarsal joints more robust than the tibiæ, of uniform thickness. Wings pellucid, with a very pale bluish tint, densely covered with yellowish scaly hairs, moderately ciliated on all borders with very fine hairs, and having a brassy reflection. First longitudinal reaching the anterior border about half-way to

\* Winnertz, in giving the characteristics of this genus, says, "Schwinger unbedeckt," but although I have examined a large number of specimens, my observations persistently prove the contrary.

the apex of the wing; second longitudinal vein meeting the border a short distance beyond the apex of the wing, its basal portion more than five times the length of the transverse vein; transverse vein moderately oblique; third longitudinal vein very indistinct, issuing from the basal portion of the second longitudinal a little beyond the middle, running almost straight to the margin; fourth longitudinal vein rather near the posterior border, little arcuated, the anterior branch very indistinct. (Description drawn from dried specimen).

*Hab.*—Sydney (Skuse). January.

87. *CAMPYLOMYZA ÆRATIPENNIS*, sp.n.

♀.—Length of antennæ.....	0·015 inch	...	0·38 millimètre.
Expanse of wings.....	0·040 × 0·020	...	1·01 × 0·50
Size of body... ..	0·040 × 0·08	...	1·01 × 0·20

Antennæ pale brown, 2-+9-jointed; joints globose, verticillate-pilose, separated by pedicels which are as long as the joints. Thorax deep brown, with a golden yellow pubescence. Poisers brown, pale yellowish at the base, pubescent. Abdomen yellowish-brown, paler between the segments, last two or three joints considerably paler than the preceding ones. Legs short, somewhat robust, brownish-yellow; femora and tibiæ strong; first tarsal joint slender. Wings pellucid, with a pale bluish tint, densely clothed with scaly hairs, and having a bright brassy reflection; the apex not quite so rounded as in *perpallida*. Costal vein strongly developed. First longitudinal vein reaching the anterior margin about half way to the apex of the wing; second longitudinal meeting the costal immediately beyond the apex; its basal portion about five times as long as the cross-vein; cross-vein moderately oblique; third longitudinal vein very pale, issuing from the basal portion of the second longitudinal at about two-thirds of its length, and disappearing at about two-thirds of the distance to the margin; fourth longitudinal vein indistinct, both branches almost invisible before joining the posterior margin and very moderately arcuated. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters). December.

88. *CAMPYLOMYZA PERSIMILIS*, sp.n.

♀.—Length of antennæ.....	0·015 inch	...	0·38 millimètre.
Expanse of wings. ....	0·030 × 0·012	...	0·76 × 0·30
Size of body.....	0·020 × 0·006	...	0·50 × 0·15

Antennæ pale brown, 2- + 9-jointed; joints sub-globose, sparsely verticillate-pilose, terminal joints considerably smaller than the preceding ones; pedicels not as long as the joints. Hypostoma and front sordid yellowish-brown. Palpi yellow. Thorax brown, minutely pubescent; pleuræ sordid yellowish-brown. Halteres long and moderately robust, club elongate, with blackish pubescence, stalk yellowish. Abdomen uniformly sordid yellowish-brown, densely clothed with scales and hairs, paler underneath; ovipositor and lamellæ pale yellow. Legs sordid ochraceous, rather densely pubescent; femora somewhat more robust than the tibiæ and tarsi; first tarsal joint twice the length of the second, the latter as long as the following two, the three last about the same length; all slender. Wings pale yellowish at the base; pellucid, with a pale bluish tint, rather thickly covered with scaly hairs, particularly towards the tip; moderately deeply ciliated, with a very pale yellow reflection. Veins yellowish-brown. First longitudinal vein reaching the costal about half-way to the apex of the wing; second longitudinal vein somewhat sinuose before the cross-vein, reaching the border immediately below the apex; cross-vein distinct; third longitudinal vein indistinct, joining the border a short distance below the second longitudinal; fourth longitudinal vein indistinct, rather close to the margin, not very arcuated; anterior branch almost as long as the whole of the posterior vein, very indistinct. (Description drawn from fresh specimen).

*Hab.*—Sydney (Skuse). Beginning of December.

89. *CAMPYLOMYZA CROCEA*, sp.n.

♀.—Length of antennæ.....	0·015 inch	...	0·38 millimètre.
Expanse of wings.....	0·035 × 0·017	...	0·88 × 0·42
Size of body.....	0·025 × 0·008	...	0·62 × 0·20

Antennæ pale brown, 2- + 9-jointed, joints sub-globose, verticillate-pilose, pedicels rather longer than the joints. Front and palpi yellowish-brown. Thorax light red-brown, nitidous, with a yellow pubescence; pleuræ light red-brown; scutellum almost triangular, the same colour as the mesothorax, with yellow hairs. Halteres moderately long, thick, the club elongate, rather thicker than the stalk, with a deep brown or black scaly pubescence. Abdomen ferruginous-ochraceous, darker at the extremity, somewhat thickly clothed with laterally directed deep brown or black scaly hairs, the last two or three segments with a longitudinally directed pubescence; ovipositor apparently short, pale ochraceous, with narrow elongate lamellæ. Legs short, rather robust, ochraceous, with the articulations and tarsal joints tinged with ferruginous; densely pubescent. Femora and tibiæ rather robust. Tarsal joints of almost equal thickness, the base of the first one somewhat narrowed. Wings pellucid, with a pale bluish tint, densely covered with scaly hairs, well ciliated in the posterior border with delicate hairs, and exhibiting a pale brassy reflection when viewed at a certain obliquity. Costal densely covered with a short dense pubescence. First longitudinal vein indistinct at its tip, reaching the costa about half way to the apex of the wing; cross-vein not very distinct; second longitudinal vein remarkably sinuose before the cross-vein, joining the margin beyond the apex of the wing; fourth longitudinal vein little arcuated, invisible before reaching the posterior border, its anterior branch almost indistinguishable. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Skuse).

#### 90. CAMPYLOMYZA SUBTILIS, sp.n.

♂.—Length of antennæ.....	0.030 inch	...	0.76 millimètre.
Expanse of wings.....	0.040 × 0.018	...	1.01 × 0.45
Size of body.....	0.030 × 0.006	...	0.76 × 0.15

Antennæ yellow, tinged with brown, 2- + 13-jointed, the last joint very small and rudimentary; basal joints about the same size as the flagellar joints; joints small near the base of the



flagellum, almost globose, somewhat flattened, one half shorter than the pedicels, towards the tip very much flattened, the pedicels being then three times their length; long and dense verticillate hairs. Palpi densely covered with a pale yellowish pubescence. Front pale brown. Thorax sordid yellowish-brown, with moderately long pale hairs; pleuræ yellowish; scutellum narrow, lunate, with a few hairs. Halteres rather short, the club elongate, covered with a brown pubescence, one half thicker and rather longer than the stem, the stem yellowish, pubescent. Abdomen almost cylindrical, densely pubescent, sordid yellowish-brown for the first four segments, darkening into dusky brown on the terminal segment. Legs short and slender, sordid ochraceous, densely pubescent. Femora rather thicker than the tibiæ, but not very strongly developed. Tarsal joints of equal thickness, except that the metatarsal joint is somewhat narrowed at the base. Wings pellucid, with a very pale bluish tint, very densely covered with scaly hairs, densely ciliated, and having an indifferent brassy reflection. First longitudinal vein joining the costa half way to the apex of the wing; second longitudinal reaching the margin a little beyond the apex of the wing, its basal portion somewhat sinuose, six times as long as the transverse vein; transverse vein rather pale, joining the first longitudinal at three-fourths of its length from the base; third longitudinal vein most indistinct; fourth longitudinal very pale, very little arcuated, invisible just before the posterior border; anterior branch only just distinguishable, almost as long as the whole posterior vein. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters and Skuse).

91. *CAMPYLOMYZA VICINA* sp.n.

♂.—Length of antennæ.....	0·020 inch	...	0·50 millimètre.
Expanse of wings.....	0·040 × 0·018	...	1·01 × 0·45
Size of body.....	0·030 × 0·006	...	0·76 × 0·15

Antennæ pale brown, 2- + 13-jointed, the last joint very small and rudimentary; basal joints thicker than but not so wide as



those of the flagellum, yellowish; flagellar joints large, considerably flattened, much darker than the pedicels, with long dense brown verticillate hairs, the two joints immediately preceding the terminal rudimentary joint very close together, and not so flattened as the others. Palpi rather robust, densely pubescent, sordid ochraceous. Thorax dusky yellowish-brown, with two somewhat dense rows of pale hairs from the collare to the scutellum; pleuræ yellowish-brown; scutellum prominent, narrow, scarcely lunate, yellowish-brown. Halteres moderately long, the stem rather thick, yellowish, with a pyriform club, densely covered with a brownish pubescence. Abdomen dusky yellowish-brown, the dorsal segments densely scaled, terminal segment rather thickly haired. Legs short and slender, pale ochraceous, the coxæ and tarsi tinged with ferruginous. Second tarsal joint nearly as long as the first; the remaining joints somewhat thicker than the two first. Wings pellucid, with a very pale bluish tint, densely covered with scaly hairs, particularly on the apical portion; brassy reflection. First longitudinal vein invisible just before reaching the costa; second longitudinal vein not sinuose before the cross-vein, reaching the margin immediately beyond the apex of the wing, its basal portion six times the length of the cross-vein; cross-vein not very oblique, pale; third longitudinal vein most indistinct; fourth longitudinal indistinct, invisible some distance before the posterior border; anterior branch scarcely distinguishable, very little arcuated. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters and Skuse).

## 92. *CAMPYLOMYZA IMPEXA*, sp.n.

♂.—Length of antennæ... . 0.020 inch ... 0.50 millimètre.

Expanse of wings..... 0.035 × 0.017 ... 0.88 × 0.42

Size of body..... 0.020 × 0.005 ... 0.50 × 0.13

Antennæ ochraceous-brown, 2 + 12-jointed; basal joints pale reddish-brown, first basal joint much larger than the second,

pilose; flagellar joints considerably flattened; the terminal joint with a small projection; verticils long and dense; pedicels one half longer than the joints. Palpi ochraceous-brown. Thorax deep brown, with a sparse golden-yellow pubescence; pleuræ pale reddish-brown. Halteres long and rather robust, club elongate; stalk pale, club covered with a black pubescence. Abdomen deep brown densely covered with scales and hairs. Legs ochraceous-brown, the femora somewhat ferruginous, very densely pubescent; femora and tibiæ robust; first tarsal joint slender; second not so long as the first; the rest of nearly equal length. Wings somewhat ferruginous at the base, pellucid, with a very pale brownish tint, densely ciliated and covered with a scaly pubescence; rich golden and roseous reflections. First longitudinal vein reaching the costal about half way to the apex of the wing; second longitudinal vein meeting the border a little beyond the apex; cross-vein very distinct, not very oblique; third longitudinal vein straight, rather indistinct, reaching the border a little below the second longitudinal vein; fourth longitudinal gradually arcuating into the posterior margin, anterior branch very indistinct. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters and Skuse). September.

### 93. CAMPYLOMYZA PELLAX, sp.n.

♂.—Length of antennæ.....	0·015 inch	...	0·38 millimètre.
Expanse of wings.....	0·025 × 0·010	...	0·62 × 0·25
Size of body.....	0·020 × 0·005	...	0·50 × 0·12

Antennæ brown, 2-+11-jointed; basal joints paler than those of the flagellum; flagellar joints almost twice as wide as long, particularly those near the base, almost as long as the pedicels, and having long brownish verticillate hairs; terminal joint rather larger than the one immediately before it, and considerably rounded. Palpi slender, sordid yellowish, deeply pubescent. Thorax black or nearly so, nitidous, with somewhat long pale hairs; pleuræ dusky brown; scutellum narrow, lunate, deep umber-brown. Halteres dusky yellow, club pyriform, pubescent.

Abdomen deep brown, almost black, scaled, with a very minute pubescence on the terminal segment. Legs short and slender, of a uniform dusky yellow colour, with only the tarsi densely pubescent, and all the joints of almost uniform thickness. First tarsal joint twice the length of the second. Wings pellucid, with a very faint bluish tint, densely covered with scaly hairs with a slight intermixture of fine simple hairs, densely ciliated, and having a bright almost silvery reflection. First longitudinal not very distinct, invisible shortly after leaving the cross-vein; second longitudinal vein somewhat crooked before the cross-vein, but not sinuose, reaching the wing-margin just beyond the apex, its basal portion about six times the length of the cross-vein; cross-vein pale, indistinct anteriorly; third longitudinal not distinguishable; fourth longitudinal vein very distinct until just before joining the posterior border, when it becomes most indistinct; anterior branch invisible. (Description drawn from dried specimen).

*Hab.*—Elizabeth Bay (Masters and Skuse).

#### 94. CAMPYLOMYZA SYDNEYENSIS, Schiner.

*Campylomyza Sydneyensis*, Schiner, Diptera der Novara-Expedition, Zool. Theil. Bd. II., p. 7.

"Shining black, the legs very dark pitchy brown. Antennæ moniliform, 2-+12-jointed, the flagellar joints pressed to one another, almost of equal length, only the last double the length of the preceding ones, and considerably narrower than the latter; the hairs very delicate. Palpi blackish-brown, the second joint very long and robust, standing off angularly from the first, the two last small. The legs, and particularly the thighs, strong; the last joint of the tarsi slender and much longer than the preceding. Wings almost hyaline, microscopically haired; the veins normal, but the cross-vein is not very distinct, and there appears between the discoidal and the postical, towards the margin of the wing, a piece of a vein, which must be regarded as a rudiment of the lower branch of the discoidal. The terminal lamellæ of the ♀ brown."

$\frac{3}{4}$ ".—Sydney.

*Obs.*—Not having seen this species, I am unable to definitely fix its true position amongst the rest of the genus, the above description even giving no clue as to which division the insect belongs, but I have placed it here provisionally.

b. *Wings rounded at the base.*

95. *CAMPYLOMYZA AMPLIPENNIS*, sp.n.

♂.—Length of antennæ..... 0·025 inch ... 0·62 millimètre.  
 Expanse of wings..... 0·045 × 0·020 ... 1·13 × 0·50  
 Size of body..... 0·035 × 0·008 ... 0·88 × 0·20

Antennæ sordid yellowish, 2-+12-jointed; basal joints rather smaller than the first flagellar joint, the latter appearing almost pyriform, remaining joints sub-globose, rather wider than long on the basal half of the flagellum, the rest somewhat longer than broad; verticillate hairs sparse and unequal; pedicels about half as long as the joints. Palpi slender, sordid yellowish. Thorax black, almost levigate, with a short, pale, scattered pubescence; pleuræ sordid yellowish; scutellum very narrow, hardly lunate, sordid yellowish. Halteres sordid yellowish, with minute black scales and hairs, club pyriform. Abdomen dusky brown, with a dull ochraceous tinge on the first two or three and the last two dorsal segments, moderately clothed with a golden-yellow pubescence. Legs short and rather slender, of a uniform dusky ochraceous colour, densely pubescent. Femora and tibiæ somewhat more robust than the tarsi. Metatarsal joint longer than the two following combined. Wings pellucid, with a delicate bluish tint, moderately and uniformly covered with very fine yellowish hairs, and sparsely ciliated with longer hairs of the same description; no scales or scaly hairs on the wings. First longitudinal vein rather wide of the costa, paler at its tip; second longitudinal vein at its root very near the first longitudinal, then considerably diverging, but bent a little anteriorly just before the cross-vein, and afterward resuming its posterior inclination, joining the margin at the apex of the wing, its basal portion rather more than three times the length of the cross-vein; cross-vein distinct, not very oblique; third longitudinal vein pale, very

much arcuated; anterior branch indistinct, very little bent. (Description drawn from dried specimen).

*Hab.*—Middle Harbour (Skuse).

B. Wings with five longitudinal veins; the third furcate; the fourth and fifth separate from their base.

#### Genus 2. TRITOTYGA, Loew.

*Tritotyga*, H. Loew in O.-Sacken, Mon. Dipt. N. America, 1862, pp. 178-179.

Antennæ as in the last genus, the number of joints uncertain. Wings rounded at the base and apex. Second longitudinal vein running rather close to the costa and joining much before the apex of the wing; the upper branch of the third longitudinal vein forming a double curve, almost in the shape of an S (Pl. III., fig. 21).

*Obs.*—This genus was founded by Prof. Loew upon an imperfect specimen of a North American species, and no further example has to my knowledge since been observed in any country. The whole structure of the body of this insect, according to Prof. Loew, shows the nearest relation to *Campylomyza*.

#### Genus 3. CATOCHA, Haliday.

*Catocha*, Haliday, Ent. Mag. I., 1833, p. 156; Macquart, S. à B. II., 1835, p. 654; Rondani, 11<sup>da</sup> Mem. Parma, 1840, &c.; Win-nertz, Stett. E.Z. VII, 1846, p. 20 (*Macrostyla*); V. z.-b. G. Wien, 1870, p. 27; Walker, I.B. III. 1056, p. 59; O.-Sacken, Mon. Dipt. N. America, 1862, p. 177; Schiner, F.A. II., 1864, p. 412.

Antennæ moniliform, verticillate; in the ♂ 2-+14, and in the ♀ 2-+8-jointed, the flagellar joint almost ovate; pedicels longer in the ♂ than the ♀; the first joint sessile. Wings large, considerably rounded at the apex, with cuneiform base. First longitudinal vein long, arcuating into the costa somewhat abruptly; second longitudinal vein reaching the margin about the apex of the wing; the upper branch of the third longitudinal vein forming a smooth curve; small cross-vein at or before the middle of the first longitudinal vein (Pl. III., fig. 22).

*Obs.*—Only a few European species known.

## Genus 4. LESTREMIA, Macquart.

*Lestremia*, Macquart, Dipt. du Nord de la France I., 1826, p. 173; Meigen, S.B. VI., 1830, p. 308; Rondani, 11<sup>da</sup> Mem. Parma, 1840; (*Lestremia*, *Mimosciara*, and *Yposataea*) Prodromus I., 1856, p. 198; Zetterstedt, D.Sc. X., 1851, p. 3767; Walker, I.B., III., 1856, p. 57; O.-Sacken, Mon. Dipt. N. America, 1862, p. 178; Schiner, F.A. II., 1864, p. 413; Winnertz, V. z.-b. G. Wien, 1870, p. 30.

Antennæ moniliform, verticillate; in the ♂ 2-+14-, in the ♀ 2-+9- to 2-+10-jointed; the joints in the ♂ almost ovate, pedicelled, in the ♀ more cylindrical, with short pedicels. Wings large, moderately broad, with rounded apex, and prominent posterior angle. First longitudinal vein very short; second longitudinal vein short, running rather close to the costa, joining the border much before the apex of the wing; third longitudinal vein with a very long fork; cross-vein small, beyond the middle of the first longitudinal vein (Pl. III., figs. 23 and 24).

*Obs.*—A few European and American species only are known.

## II. OCELLI WANTING.

## Genus 5. CECIDOGONA, Loew.

*Cecidogona*, H. Loew, Stett. E.Z. 1844, p. 324; Walker, I.B. III., 1856, p. 58; O.-Sacken, Mon. Dipt. N. America, I., 1862, p. 178; Schiner, F.A. II., 1864, p. 413 (*Lestremia*); Winnertz, V. z.-b. G. Wien, 1870, p. 35 (*Lestremia*).

Antennæ in the ♀ 2-+9-jointed; joints verticillate, with very short pedicels. Wings tolerably broad, with rounded apex and posterior angle. First longitudinal vein very short; second longitudinal vein reaching the margin close to the apex of the wing; branches of the third longitudinal vein long, almost parallel to one another; cross-vein very oblique.

*Obs.*—As far as I am aware, Loew's type of the genus, *Cecidogona carnea*, described from Europe, is the only known species.



## EXPLANATION OF PLATES.

## PLATE II.

Fig. 1. Venation of wings in the genus *Heteropeza*.

2.	"	"	"	<i>Miastor</i> .
3-16	"	"	"	<i>Cecidomyia</i> .
3.	"	"	sub-genus	<i>Gonioclema</i> .
4. }	"	"	"	<i>Cecidomyia</i> .
5. }	"	"	"	<i>Cecidomyia</i> .
6.	"	"	"	<i>Diplosis</i> (A).
7.	"	"	"	" (B).
8.	"	"	"	<i>Asphondylia</i> .
9.	"	"	"	<i>Hormomyia</i> .
10.	"	"	"	<i>Necrophlebia</i> .
11.	"	"	"	<i>Chastomera</i> .
12.	"	"	"	<i>Colpodia</i> .
13.	"	"	"	<i>Epidosis</i> .
14.	"	"	"	<i>Epidosis gibberosa</i> .

## PLATE III.

15. Venation of wings in the sub-genus *Asynapta* (a).

16.	"	"	"	" (b).
17.	"	"	genus	<i>Spaniocera</i> .
18.	"	"	"	<i>Lasioptera</i> .
19.	"	"	"	<i>Campylomyza</i> (a).
20.	"	"	"	" (b).
21.	"	"	"	<i>Tritozgya</i> .
22.	"	"	"	<i>Catocha</i> .
23. }	"	"	"	<i>Lestremia</i> .
24. }	"	"	"	<i>Lestremia</i> .

25. Diagram of an ideal typical wing illustrating the vein-system in the *Diptera*.